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TABLE *of* CONTENTS

Hematologic Disorders in the Newborn
C. W. REIQUAM, M.D. AND NATHAN J. SMITH, M.D. 123

The Comparative Results and Treatment for Cancer of the Rectum
C. NAUNTON MORGAN, M.D. 135

Low Back Pain
CARROLL B. LARSON, M.D. 142

Behavior Problems of Children
JOHN G. YOUNG, M.D. 150

Congenital Atresia of the Rectum and Its Complications
WILLIS J. POTTS, M.D. 156

Retinal Manifestations of Systemic Diseases
STACY R. METTIER, JR., M.D. 162

Medical and Surgical Problems in Liver Disease
WILLIAM A. ALTEMEIER, M.D. AND RICHARD W. VILTER, M.D. 167

Food Intolerance in Early Infancy
VICTOR C. VAUGHAN, III, M.D. 179

The Role of Hiatal Hernia in the Differential Diagnosis of Gastrointestinal and Cardiac Disease
HENRY L. BOCKUS, M.D. 185

Methods of Neurologic Diagnosis and Their Critical Assessment
BERNARD H. SMITH, M.D. 192

(Continued on page A-4)

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Indications for Cardiac Surgery
ORMAND C. JULIAN, M.D. 202

Diffuse Pulmonary Fibrosis
LEROY HYDE, M.D. 208

Clinical Indications for Pelvic Surgery
JOHN BURKE, M.D. AND EDWARD G. WINKLER, M.D. 213

Repeat Cesarean Section
JAMES P. MARR, M.D. AND JAMES H. KO, M.D. 215

DIAGNOSTIC CLINIC

Problems in Abdominal Surgery
WALTMAN WALTERS, M.D. 221

SCIENTIFIC EXHIBIT

Surgical Considerations in the Treatment of Cerebral Arterial Insufficiency
E. STANLEY CRAWFORD, M.D., MICHAEL E. DEBAKEY, M.D.,
WILLIAM S. FIELDS, M.D., GEORGE C. MORRIS, JR., M.D.
AND DENTON A. COOLEY, M.D. 227

DISEASES OF THE SKIN

Benign Tumors of the Skin
HAROLD N. COLE, JR., M.D. 238

SELF-HELP DEVICES

Aids to Dressing
EDWARD W. LOWMAN, M.D. AND HOWARD A. RUSK, M.D. 243

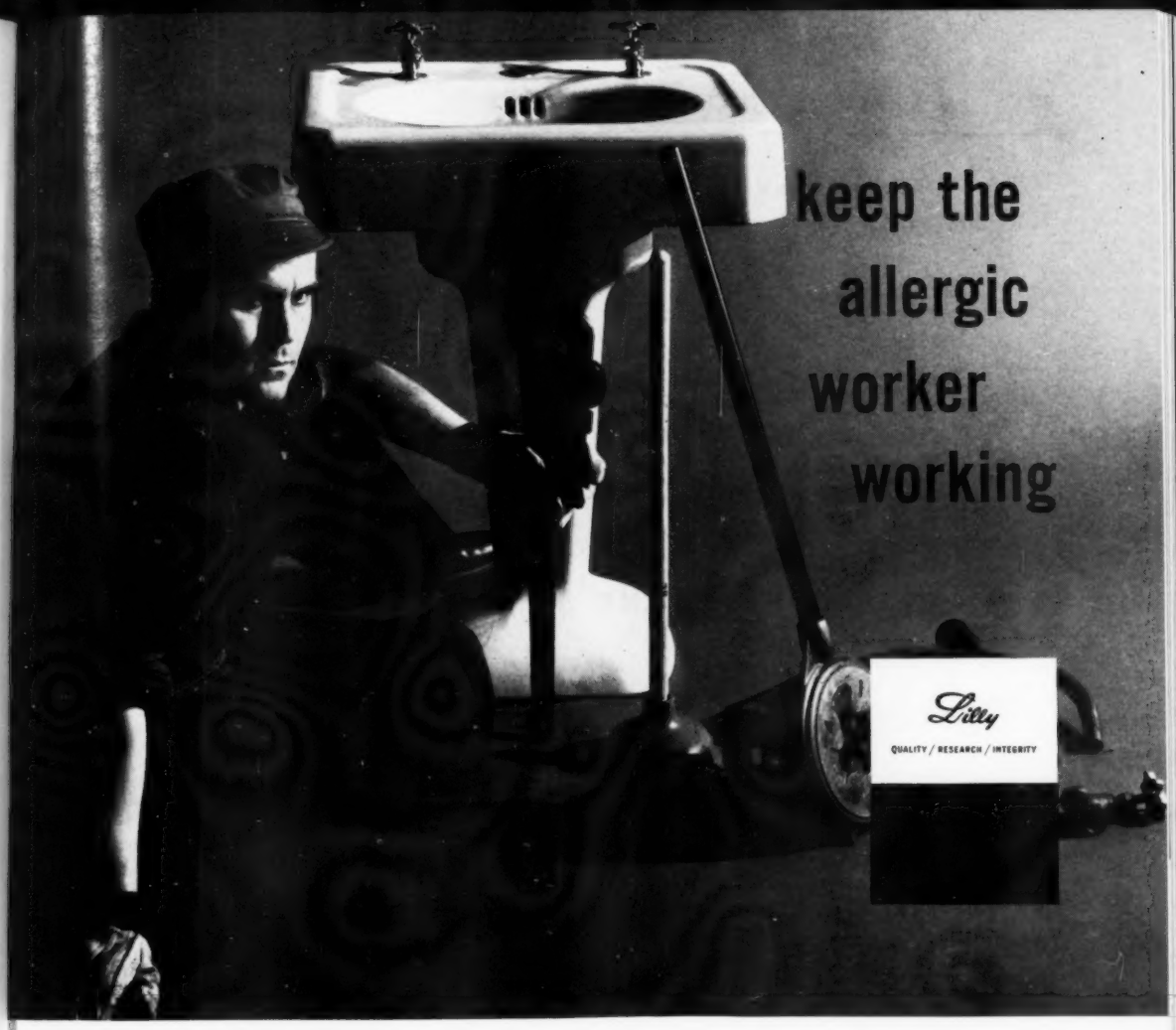
CLINICOPATHOLOGIC CONFERENCE

Case Report
FROM THE VETERANS ADMINISTRATION HOSPITAL, HINES, ILLINOIS 246

NUTRITION IN CLINICAL MEDICINE

Amino Acid Requirements of Man
JEAN MAYER, PH.D. 252

(Continued on page A-6)



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DEPARTMENTS

EDITORIALS 259

Controlled Clinical Trials
Geographical Pathology
Some Problems of Gerontology

YOUR QUESTIONS ANSWERED A-20

Long-term Catheterization
Headache Following Accident
Complications of Pregnancy
Urticaria Pigmentosa
Thyroid Administration
Diabetes in Children

"PLACEBO"—Jackson A. Smith, M.D. A-28

WHAT'S HAPPENING IN MEDICINE ..... Facing A-32-33

LABORATORY NOTES. Ellis S. Benson, M.D. A-42

MEETINGS AND POSTGRADUATE COURSES A-46, A-116

FORENSIC MEDICINE A-52

Impartial Medical Testimony, Part 2
LOUIS E. VIKO, M.D. AND PRESTON A. WADE, M.D.

RADIOLOGY FOR PRACTICING PHYSICIANS A-75

The Gallbladder and Bile Ducts
NELS STRANDJORD, M.D.

THROUGH THE STETHOSCOPE A-92

MEDICINE FROM ABROAD A-96

NEW FOR YOUR ARMAMENTARIUM A-138

FINANCIAL PLANNING FOR THE MEDICAL PRACTITIONER
J. K. Lasser Institute ..... Facing A-184-185

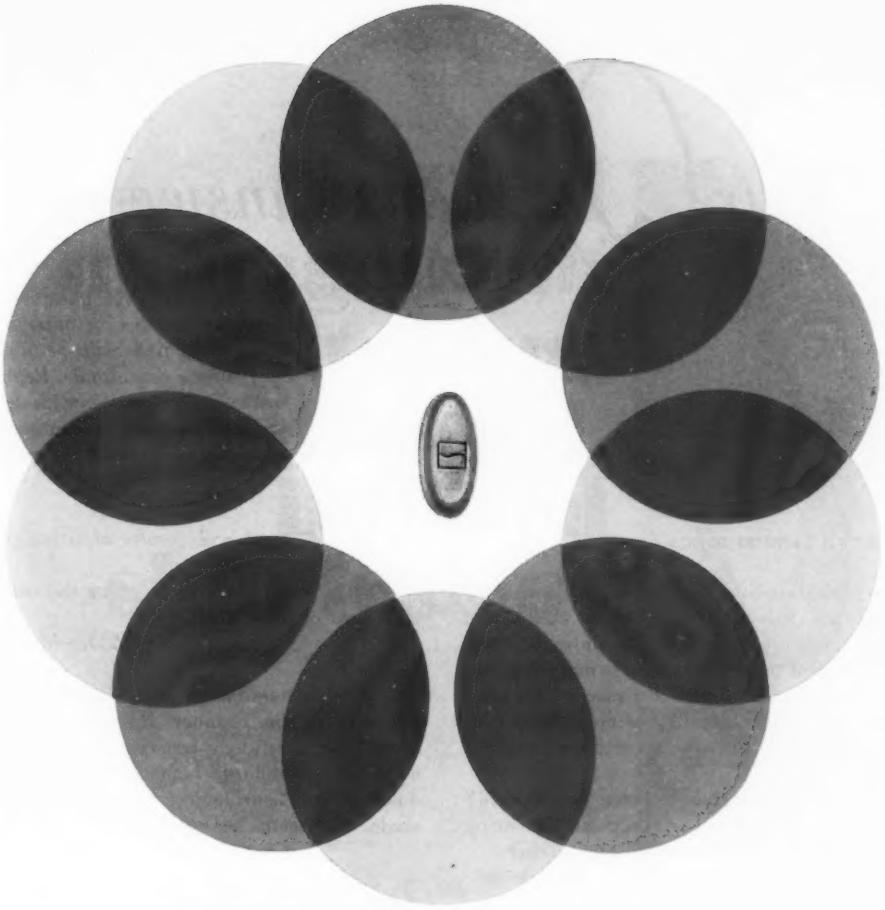
THE MEDICAL BOOKMAN A-186

PRODUCTS BY THERAPY INDICATIONS A-196

DR. PEPYS' PAGES. Morris Fishbein, M.D. A-206

THE MEDICAL MUSE. Richard Armour A-213

INDEX TO TECHNICAL EXHIBITS A-229



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1. Feightner, R. L.: J. Indiana M. A. 51:1672-1674 (Dec.) 1958.

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Your Questions answered

Readers may send questions from their own practice or other medical problems which will be answered by qualified consultants. Replies are forwarded by mail immediately and selected questions and answers are published each month in this section.

• LONG-TERM CATHETERIZATION

Q. A patient is under constant catheterization with a Foley catheter because of an obstruction due to a boggy prostate. At the onset of acute retention about three weeks ago, urinary findings were within normal limits. Because of his poor physical condition, operation is considered very risky; therefore, catheterization must continue indefinitely.

How often should the catheter be changed? What special procedures are necessary in caring for a patient on a long-term catheterization?

M.D.—Massachusetts

A. A catheter should be changed every three or four weeks when it is in the urethra. However, in this case I would advise that a suprapubic catheter be introduced, under local anesthesia if necessary, because of the danger of repassing the catheter through the urethra in a patient whose general health precludes surgery.

Many patients with retention of urine are improved sufficiently after complete drainage so that a prostatectomy of some kind can be done.

• HEADACHE FOLLOWING ACCIDENT

Q. A 17 year old girl was injured in an automobile accident. She believes she was thrown against the dashboard, but she did not become unconscious. After the accident, her nose bled and her left knee and leg were tender.

At the present time, she has a headache in the region of the forehead once a day, lasting for 10 to 20 minutes. X-rays of her skull and left leg and knee reveal no abnormalities; blood pressure, blood count and results of urinalysis are within normal limits.

What is your opinion regarding the cause and treatment of these headaches?

M.D.—Michigan

A. It is impossible to ascertain the cause of headache in this instance. However, this patient should be carefully observed for the development of a subdural hematoma. Periodic funduscopic and neurologic examinations should be made. The headaches probably will subside.

• COMPLICATIONS OF PREGNANCY

Q. What treatment would you advise for a 27 year old primigravid patient who is eight months pregnant and has mild diabetes, preeclampsia and possibly latent syphilis?

The initial examination, conducted only recently, revealed a positive venereal disease laboratory reaction of 1:16. Blood pressure was 160/90, albumin 2 plus and fasting blood sugar 150 mg. per cent. The patient is hospitalized now for further serologic examination, including the *Treponema pallidum* immobilization test.

M.D.—Wisconsin

A. I would suggest the following management: (1) careful control of the toxemia; (2) careful control of the diabetes; (3) termination of the pregnancy at 37 to 38 weeks by induction or, more likely, cesarean section; and (4) preoperative treatment of the syphilis, chiefly to protect the personnel of the hospital. It is too late to protect the fetus.

(Continued on page A-22)

new for total management of itching,[1,2] inflamed,[3,4] infected[5,6] skin lesions

Mycolog ointment

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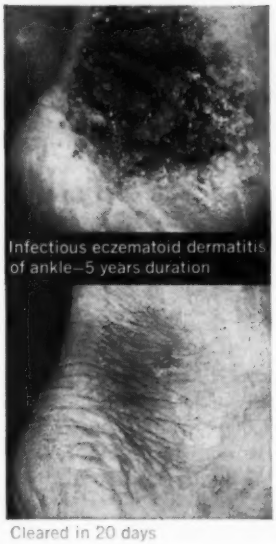

Infectious eczematoid dermatitis of ankle—5 years duration

Cleared in 20 days

Mycolog Ointment—containing the new superior topical corticoid Kenalog—reduces inflammation,[3,4] relieves itching,[1,2] and combats or prevents bacterial, monilial and mixed infections.[8-7] It is extremely well tolerated, and assures a rapid, decisive clinical response for most infected dermatoses.

> **"Thirty-one of 38 patients . . . obtained excellent or good control of dermatological lesions . . . [Mycolog] was highly effective, particularly in the management of mixed infections. Several recalcitrant eruptions which had not responded to previous therapy were remarkably responsive to the daily application of this preparation over periods of 2 to 3 weeks."[5]**

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References: 1. Shelmire, J.B., Jr.: Monographs on Therapy 3:164 (Nov.) 1958. • 2. Nix, T.E., Jr., and Derbes, V.J.: Monographs on Therapy 3:163 (Nov.) 1958. • 3. Robinson, H.C.V.: Bull. School of Med., U. Maryland 43:54 (July) 1958. • 4. Sternberg, T.H., Newcomer, V.D., and Reinert, R.M.: Monographs on Therapy 3:115 (Nov.) 1958. • 5. Clark, R.F., and Hallett, J.J.: Monographs on Therapy, 3:154 (Nov.) 1958. • 6. Smith, J.G., Jr., Zaweski, R.J., and Blank, H.: Monographs on Therapy, 3:111 (Nov.) 1958. • 7. Monographs on Therapy, 3:137 (Nov.) 1958. • 8. Howell, C.M., Jr.: North Carolina M.J. 19:449 (Oct.) 1958. • 9. Berenton, E.S.: South. M.J. 50:547 (April) 1957.

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• URTICARIA PIGMENTOSA

Q. An eight month old boy has 35 patches of urticaria pigmentosa, the majority of which are on the trunk. Otherwise, he is a healthy child, with no family history of the disease. Is there any effective treatment? What is the prognosis?

M.D.—Ontario

A. There is no completely satisfactory treatment for urticaria pigmentosa. In critical, acute episodes, corticoid therapy provides effective palliation, but it should not be used for long-term treatment. Some physicians consider x-rays helpful, but it seems unwise to use much irradiation on such a widespread, benign dermatosis. The macular lesions of urticaria pigmentosa are thought to represent mast cell tumors. When mechanically stimulated, these cells release histamine and heparin, producing a localized wheal. Itching can be controlled in most cases with antihistamines and soothing lotions.

The prognosis is usually good. The lesions often clear at adolescence, and nearly all patients improve with maturity.

• THYROID ADMINISTRATION

Q. Do edema of the ankles and muscular soreness result from administering thyroid substance to patients with myxedema? What other side effects are caused by this treatment?

M.D.—North Carolina

A. No side effects should follow the administration of thyroid substance to patients with myxedema if the diagnosis is correct and the dosage is properly regulated. I have not observed edema of the ankles as a result of this therapy. Often, muscular soreness and stiffness in these patients are caused by hypothyroidism and are relieved by the administration of thyroid substance.

• DIABETES IN CHILDREN

Q. About a month ago, a four year old girl was successfully treated for impetigo. During the course of treatment, a routine urinalysis using CLINITEST® tablets showed a 2 plus sugar reaction. A repeat urinalysis using both Clinitest tablets and TES-TAPE® revealed a 4 plus sugar reaction. Acetone was absent and specific gravity was 1.030.

The results of subsequent tests made approximately a week apart were as follows: Fasting blood sugar was 107 mg. per cent (urinary sugar determination not done). Fasting blood sugar was 155 mg. per cent; one and one-half hours postprandial, 300 mg. per cent; both urine sugars, 4 plus. Fasting blood sugar was 128 mg. per cent; two hours postprandial, 298 mg. per cent; both urine sugars, 4 plus, and a trace of acetone in both specimens.

Although the child has had repeated upper respiratory infections, there is no known history of diabetes mellitus in the family and she has been entirely asymptomatic. Skull and chest x-rays, the hemogram and findings at physical examination were essentially normal.

In his textbook, Joslin recommended that an asymptomatic diabetic child should be hospitalized and treated with insulin the day the disease is discovered. Do you have other suggestions for managing such cases?

M.D.—South Carolina

A. It is difficult to improve on Joslin's recommendation; immediate hospitalization and insulin treatment are certainly the safest thing to do.

Although diabetes does not always have an "explosive" onset in childhood, dependence on insulin usually develops even when the onset of the disease is gradual. Early administration of insulin in such cases is beneficial for a number of reasons.

1. If, as statistical studies indicate, good control of the disease delays or prevents complications, then the juvenile diabetic patients with a potential expectancy of long life and great likelihood of diabetic complications need accurate regulation as early and continuously as possible.

2. Discipline of regulation in control of diabetes is best acquired if there is no equivocation at the start. If the parents have some doubt concerning the accuracy of the diagnosis and the need for the injection of insulin, the condition of the child may be refractory to good management at a later time, when the acute need for this measure inevitably arises.

3. The variable activities and dietary habits of youngsters present a further argument in favor of an initially formal and complete approach to the therapy of juvenile diabetes.

4. The evidence is not complete that islet tissue will be "spared" by early therapy with insulin, but such an effect is an argument often used in favor of prompt administration of insulin once the diagnosis is established.

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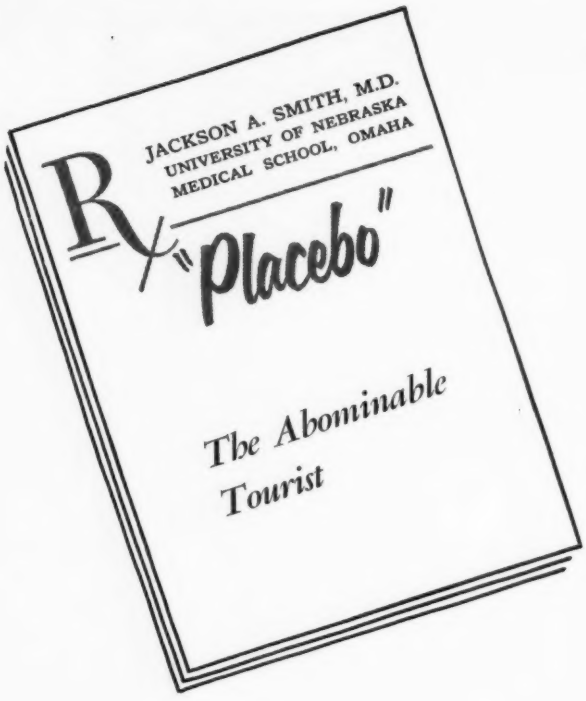

IN that remote land beyond the Holland Tunnel, from which few visitors ever return the same as they went in, there is told the legend of the abominable tourist. Few of these superstitious natives have seen this abominable tourist clearly by light of day, but many swear that on hot afternoons his tracks are everywhere, and wherever his shadow falls confusion follows. And one shouting subgroup of these aborigines claim to have seen him often, as they guide their quaint wheeled vehicles about; they say he is shaggy and shuffles about like nothing human, at times quite cunning but, basically, unquestionably stupid.

Having lived briefly among these island tribes of Manhattan and having learned a few of their strange dialects, I was the first outsider allowed to observe their strange customs and fertility rituals, which one must know to understand the origin of the legend of the abominable tourist.

First, one notes that those who inhabit this island are culturally divided in a most unusual way—not geographically, since no natural boundaries exist here, or agriculturally, since the potted plants grow as lushly on one side of this island as the other and the rainfall varies but little from end to end. Rather, they are divided by a well-worn trail into those of the East Side and those of the West Side, and, less distinctly, into an upper East Side and a lower East Side and an upper West Side and a lower West Side. It seems monotonous, but to the native it appears to have great meaning, particularly in the rites of puberty and marriage. This trail dividing East from West is called Fifth Avenue (or, in dialect, "Fif-Av").

This culture one must comprehend to see clearly the tracks and, perhaps, the shaggy form of the abominable tourist, because, gentle reader, the abominable tourist never appreciates these differences; he never seems to know or care which is the West Side (upper or lower) or the East Side (upper or lower), for his tracks are everywhere.

To get a better look at this apparition, one must consider another trait of the natives—a tendency to run amuck twice daily. This tendency seems temporally oriented and is most often manifest in early morning and late afternoon, showing a sort of diurnal variation, with peaks at 8 and 5 o'clock. During these periods, the natives are most dangerous. They show much irritability, even to each other, but particularly to those from other islands who have come to trade; and, of course, any evidence of the abominable tourist compounds their fury beyond measure.

Depending on where they camp, according to the imaginary East or West, upper or lower, the costumes of the natives vary. The females frequently have the skin of a wild animal around their necks. Some of these animals, judging from their worn skins, were fatigued when trapped or else were a little weary of it all and just volunteered. These skins worn about the neck have many more functions for the natives than for the animals which they earlier covered. For instance, they are a symbol of the potency (at least, financial) of the males of the tribe.

On feast days, the animal skins may determine in which circle the wearers sit and the order in which they are allowed to dip into the food pot. The abominable tourist, being without culture, is apt to find the female's skin more interesting than the animal's, particularly on a hot day; and he doesn't seem

(Continued on page A-30)

. . . and one to grow on

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to care in which circle he sits, providing he is able to feed.

The tribe that dwells on this island shows a great affinity for beads and bits of glass or even for shiny objects that look like beads and bits of glass. This affinity is shown by those of the East and West, upper and lower. The baubles are worn mostly by the females—on their ears or fingers or about their arms—much like the aborigines in the Pacific Islands. These ornaments are frequently referred to as "rocks," a rather obvious derivation, and rank with animal skins as a symbol of prestige (and like tail feathers in some game birds, they seem to attract the male). Again, the abominable tourist can't tell "rocks" from "glass," daughters from "friends," or even a good table from a bad one.

The most unusual area on this small island is a clearing between two of the trails. In this bare space (called a "square," as many things are) it is hard to distinguish the tracks of the abominable tourist from those of the abominable natives, as they shuffle around aimlessly day and night. The reason for this odd circling activity is lost in antiquity, but the primitive behavior shown in this clearing in the center of the village seems to attract the abominable tourist, since here his shuffling gait goes unnoticed and the pointlessness of his existence is accepted.

The natives of this odd island show an attitude shared by many primitives, namely, that beyond their village there is nothing. According to their legends, passed on by word of mouth to all they meet and illustrated by crude drawings on barroom napkins, on one end of their tunnel is the world and on the other a wasteland, dimly seen, perhaps inhabited but probably not. This particular belief, so vocally held by these simple unfriendly people, may account for a great deal of the abominableness of the abominable tourist.

* * *

YOU KNOW THE TYPE!

She enters his office, quite certain she's ill,
And hoping, somehow, he can cure her;
He checks and discovers she's healthy and sound,
But, oh, what a job to assure her!

She tells him it's liver, or kidneys perhaps,
(Mrs. Smith took some drug to restore her)—
And she's never content with her visit, it seems,
Unless he prescribes something for her.

Stephen Schlitzer

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Efficacy of Antihemophilic Plasma in controlling the postoperative oozing that often occurs when patients have been massively transfused with banked blood has been reported by Howland.* He describes routine use of this specially processed plasma when oozing persists after closure of the wound. Fibrinolysis, he found, "usually responds dramatically" to its administration. Why this hemostatic efficiency? Because Antihemophilic Plasma is *fresh* plasma that has been rapidly processed to retain the labile clotting factors which are rapidly lost in banked blood. Hyland Antihemophilic Plasma (Irradiated, Dried) requires no grouping, typing or crossmatching. Just reconstitute with accompanying diluent and it is ready to administer.

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*Howland, W. S.: Cardiovascular and Clotting Disturbances during Massive Blood Replacement, Anesthesiology 19 (2): 140-152 (March-April, 1958).

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HYLAND

What's happening in Medicine

POSTGRADUATE MEDICINE'S REPORT of late news of interest to practicing physicians

HEIGHT UNRELATED TO LONGEVITY

American Medical Association:

- A study involving 2,925 men and 2,694 women more than 65 years of age tends to correct the impression held by some investigators and by lay people in general that tall people do not have as satisfactory a survival rate as have shorter ones. It is clear that obesity reduces the life span in this age group.—Dr. Arthur M. Master, New York.
- Although the cause of childhood schizophrenia is unknown and the condition is difficult to diagnose, delay of therapy lessens the chance for successful treatment. In the majority of patients the onset of schizophrenia is before the age of five, and it is not unusual for some children to exhibit symptoms within the first few months of life.—Dr. Edward G. Colbert, University of California at Los Angeles School of Medicine.

ENCOURAGING TEST RESULTS OF MEASLES VACCINE

Society for Pediatric Research:

- Eleven children were given an initial trial with a vaccine made of live attenuated measles virus produced from the Edmonston strain. The children, ages 2½ to 10½, received 0.2 ml. subcutaneously. Eight children had temperature elevations of from 100.8 to 103° F., lasting two to five days. A pink macular rash followed for from one to three days. There were no signs of viremia and virus was not detected in the oropharynx. There was no disability at the time of fever or rash, and the children went about their usual routine with normal activity and appetite. By the twenty-second day, complement-fixing antibodies had developed in each of the vaccinated children, with titers comparable to those encountered in patients recently convalescent from naturally acquired measles. The vaccine is now available to investigators in wide geographical distribution.—Drs. John F. Enders and Samuel L. Katz, Harvard Medical School, Boston.

RECOGNIZING IMPENDING INFARCTIONS

American College of Cardiology:

- Common signs of an impending myocardial infarction are onset of ischemic cardiac pain in a person previously free of it, sudden intensification of angina of effort in a patient with previous angina of long duration, and recurrence of pain at rest in a person who has been pain-free since an early infarction. Prompt anticoagulant treatment has been found beneficial.—Dr. R. E. Beamish, University of Manitoba Faculty of Medicine, Winnipeg.

Antidepressant drug is potent

American Chemical Society:

- Animal studies have shown that nialamide is 12 times as active as iproniazid as an antidepressant. The drug was effective for a longer period when it was administered either orally or parenterally. It seems to block the enzyme monamine oxidase, thus helping maintain within the brain the levels of serotonin and epinephrine.—Barry M. Bloom, Ph.D., Chas. Pfizer & Co., Inc., Brooklyn.
- Diampromid and phenampromid were found to be the most promising synthetic pain killers among a series of more than 100 chemically related compounds tested in animals. Indications are that the potency of diampromid lies between that of meperidine hydrochloride and morphine.—Robert A. Hardy, Jr., Ph.D., Lederle Laboratories, Pearl River, N.Y.

Ultrasound for Meniere's disease

Illinois State Medical Society:

- When ultrasonic waves were used to treat 15 cases of Meniere's disease, there was no further impairment of hearing. Vertigo was controlled in those patients adequately irradiated. Tinnitus was decreased in several patients and eliminated in three. Postoperative course in this treatment is tranquil. The patient usually is able to sit up on the first day.—Dr. Richard P. Ariagno, Northwestern University Medical School, Chicago.

Alcohol preserves neurotic marriages

American Psychiatric Association:

- Spouses of alcoholic persons often complain about their partner's drinking, yet, they themselves may become disturbed if the drinking stops. Some appear to have emotional problems similar to those of their alcoholic partners and to obtain vicarious satisfaction from the spouse's drinking behavior. In other cases, the drinking per se is not as important to the spouse as is the fact that it indicates that the partner is weak, ineffectual or impotent.—Dr. William J. Browne, University of Pittsburgh School of Medicine, Pittsburgh.
- In combination with chlorpromazine, small amounts of alcohol significantly impair coordination and judgment, including that needed for safe operation of automobiles and other complex machinery. Patients receiving chlorpromazine therapy should be cautioned on the dangers of using alcohol.—George A. Zirkle, Ph.D., Madison State Hospital, Madison, Ind.

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- To prevent tubercle bacilli from becoming resistant to drugs, alternating microbial combinations are used. One gram streptomycin at least three times a week is combined with 12 gm. PAS daily. The regimen is continued for one month. The second month, 400 mg. isoniazid and 3 gm. pyrazinamide daily are substituted. In the third month, the original regimen is repeated. All of a series of 200 patients became bacteriologically negative in six months, with no relapses to date.—Dr. E. T. Peer, Niagara Peninsula Sanatorium Association, St. Catharines, Ontario.
- Preliminary results justify the hope that mass immunization against tuberculosis may be possible with nebulized BCG without an accompanying skin hypersensitivity that would interfere with the use of the tuberculin skin test for ordinary epidemiologic purposes.—Drs. Gardner Middlebrook, National Jewish Hospital, Denver, and Sol Roy Rosenthal, University of Illinois College of Medicine, Chicago.

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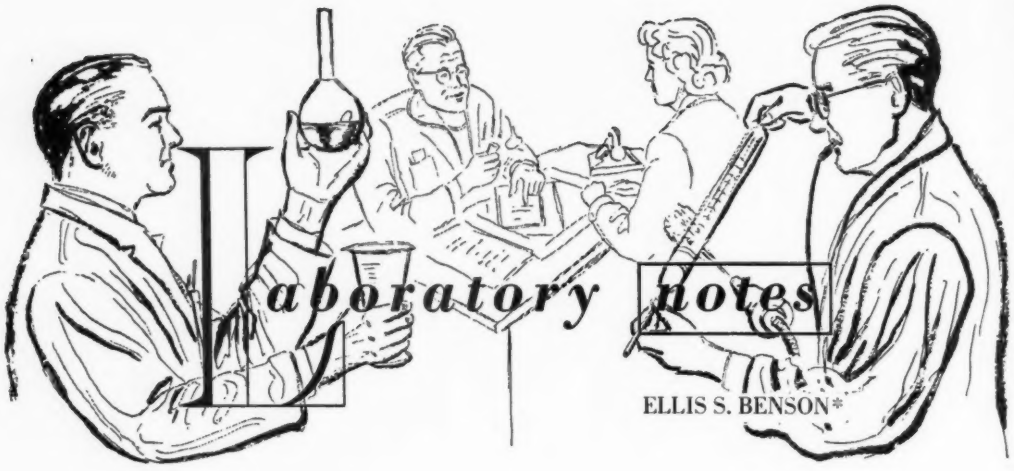

ELLIS S. BENSON*

Evaluation of Fluid Balance

THE clinical and laboratory management of fluid and electrolyte imbalance is a subject many physicians regard with awe. The varying compositions of body fluids and excretions and nonuniform usages in reporting electrolytes in terms of milligrams or milliequivalents endow the subject with a mathematical complexity which may overwhelm us at times. A number of recently published handbooks have attempted to treat this subject in a simplified, more readily understandable manner, and one of the more successful of these was briefly reviewed not long ago by Dr. Sanford.[1,2]

The impossibility of discussing adequately in all its ramifications a topic as complex as that of fluid balance in a column such as this is quite obvious. Certain features of its management, however, may bear brief emphasis. This discussion will be concerned primarily with the evaluation of water balance.

Frequently, fluid imbalances are iatrogenic, due to inadequate replacement of fluid loss in seriously ill patients or to inappropriate replacements, such as the overenthusiastic administration of salt-free parenteral fluids. In avoiding these pitfalls, a heavy reliance on the laboratory may not be necessary. One may find considerable guidance in careful history taking and observations of the physical status of the patient, including daily weighing and recording of daily fluid intake and output.

History taking should include carefully worded questions concerning fluid intake, urinary output and abnormal fluid losses, such as the following:

1. Approximately how much fluid has the patient taken daily during his illness? If there has been a restricted intake, for how long has this taken place?

2. Has there been any notable diminution in urine volume? (The patient will reliably note only marked diminution in urine volume—to oliguric levels.)

3. Have there been abnormal losses of fluid through vomiting or diarrhea? If so, approximately how much? Has there been excessive sweating? If so, for how many days?

4. Has there been weight loss? If so, for how long?

5. Has food intake been restricted? If so, for how long?

Regarding this approach, one should note

(Continued on page A-44)

*Director of Hospital Laboratories and Associate Professor of Clinical Laboratory Medicine and of Pathology, University of Minnesota Medical School, Minneapolis, Minnesota.

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that insensible perspiration plus water excreted in stool are approximately equal to the water of food plus the water of oxidation, and in a normal person the urine volume is about equal to the volume of liquids taken. If food intake has been markedly restricted, insensible loss of approximately 400 cc. per day must be added in calculating the fluid loss. If excessive sweating has taken place, an additional 0.5 cc. of fluid per kilogram of body weight may be lost per hour; in a 70 kg. man this could amount to about 800 cc. Fever increases this loss, and in febrile patients who have been sweating excessively, around 1000 cc. should be added to the daily fluid deficit. From information gained in this way, an estimate of the fluid deficit may be made. The following can be used as an example of the simplified calculations involved:

A 50 kg. (110 lb.) patient has been sick for two days with little if any water and food intake; his temperature has ranged between 100.5 and 102.5° F. and he has been visibly sweating. He has not been oliguric, and one might estimate his urine output for the two days as averaging 700 to 800 cc. per day. A rough calculation of his fluid deficit per day is:

700 cc. loss in urine in excess of intake
400 cc. insensible loss not balanced by food intake
1000 cc. excess loss due to sweating and fever

The loss is 2100 cc. per day or 4200 cc. altogether, representing a loss in body weight of about 9 lb. If, however, by history his normal weight prior to the illness was established as 117 lb., his weight now is 110 lb., and all his weight loss is ascribed to fluid loss, his deficit is $7 \div 2.2 = 3.2$ kg. or 3200 cc. A reasonable approximation of the deficit may lie somewhere between these estimates, say 3500 cc.

Estimates of fluid deficit based on history should be checked further by physical examination. Signs of dehydration may be present such as: (1) decreased skin turgor, (2) dryness of mucous membranes and of eyes, (3) retraction of fontanels in infants, and (4) fever (and dry, hot skin).

The most frequent cause of severe dehydration is disturbance in gastrointestinal function, notably continued vomiting or diarrhea. Why this is so is best understood by referring to Gamble's[3] chart of the total volume of digestive secretions produced in 24 hours by an adult of average size:

	Cubic centimeters
Saliva	1500
Gastric secretions	2500
Bile	500
Pancreatic juice	700
Intestinal secretions	3000
Total	8200

Note that the total volume is more than twice that of the plasma volume (3500 cc). Normally these secretions are almost entirely reabsorbed but large volumes may be lost in cases of severe vomiting, diarrhea or fistula drainage.

Simple observations such as those of body weight and fluid intake and output can be used quite successfully in correcting fluid imbalances. Body weight should be determined on admission and each morning thereafter, if possible at the same time of day, on the same scale, and by the same person. Bedridden patients may be weighed on litters. Casts and large dressings will not necessarily interfere since changes in body weight may still be appreciated. Fluid intake and output should be measured daily as carefully as possible and recorded prominently in the patient's chart. If volumes of emesis and diarrheal stools cannot be measured, they should be estimated.

Figure 1 illustrates the use of body weight and records of fluid intake and output in the management of a dehydrated patient. Note that urine output finally approximated intake at the time at which the patient's weight reached a plateau (which it maintained for several days after day 8). At this time physical signs of dehydration had abated, and a normal fluid intake was maintained thereafter.

Case 2, illustrated in figure 2, was that of a patient with ulcerative colitis who became dehydrated due to inadequate fluid intake. Note the weight loss of about 12 lb. (upper graph) and the diminished urine volume. On the basis of weight loss, the fluid deficit was about $12/2.2 = 5.5$ kg. or 5500 cc. The weight curve began to rise and the urine volume to increase when fluid replacement therapy was instituted on the seventh day. The urine spe-

(Continued on page A-46)

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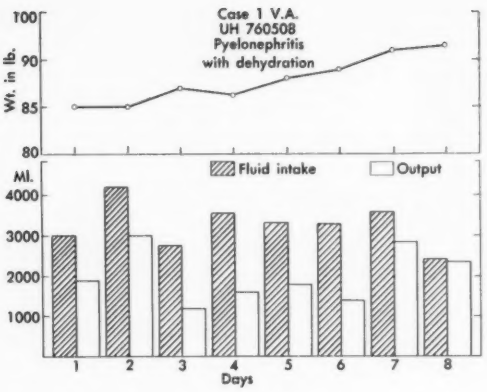

FIGURE 1.

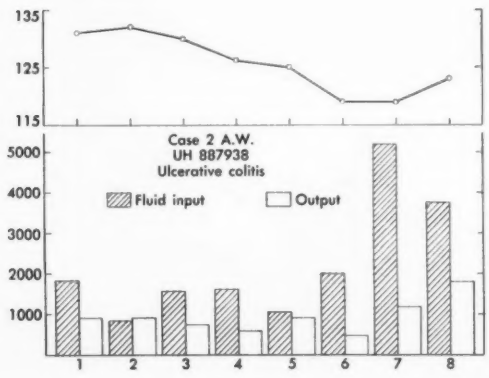

FIGURE 2.

cific gravity rose from 1.021 on day 1 to 1.032 on day 6.

Laboratory tests may be of value as supplements to (but not substitutes for) the clinical observations described. Notable among these tests are:

1. Hemoglobin or hematocrit determinations, the results of which are best appreciated if graphed or at least recorded in sequence. The value of these as indicators of hydration is obscured by bleeding, hemolysis or blood replacement.

2. Urine specific gravity measurement is a simple bedside test which can be performed easily several times a day. Specific gravity, high in dehydration, falls to normal when the fluid deficit is corrected. Renal disease or acute renal injury, if severe, limits the test's value.

3. Serum chloride and sodium may be relatively normal in simple dehydration. If one corrects the dehydration with salt-free parenteral fluids, for example, glucose in distilled water, the serum concentration of these electrolytes may fall. Carbon dioxide-combining power is often decreased due to the acidosis of dehydration; if there also has been poor caloric intake the acidosis will be more pronounced. In patients whose dehydration is the result of loss of gastrointestinal secretions, serum electrolyte abnormalities are regularly present and may include deficits of potassium.

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Forensic Medicine

In part 1 of this discussion, which appeared in this department last month, the need for impartial medical testimony was discussed from the viewpoint of the physician, the insurance carrier and the industrialist. Several states have instituted plans to improve the role of the medical witness and to expedite the outcome of personal injury cases. The following outlines of two of these plans were presented at the Conference on Costs of Personal Injuries, sponsored by the Chicago Association of Commerce and Industry and the Medical Directors Club in Chicago.

Impartial Medical Testimony, Part 2

LOUIS E. VIKO* AND PRESTON A. WADE†

Inter-Mountain Clinic, Salt Lake City, and New York Hospital, New York

Statement by Dr. Viko:

LOUIS E. VIKO

THE purpose of this discussion is to compare the role of medical witnesses under the former adversary-hearing procedures in the state of Utah with that of the medical panel under the present Utah Workmen's Compensation Law.

Much has been written about the absurdities and inequities of hearings such as those that Ivan C. Rutledge[1] termed "medicolegal tournaments." Having had experience as an attending physician and as a medical expert for both the claimant and the defense under the old law and as chairman of the present panel of internal medicine and cardiovascular diseases of the Utah State Industrial Commission, I have formed strong convictions regarding the proper role of the physician in serving the Commission and the courts, and I would like to point out some of the problems which should be corrected in any equitable plan involving medical issues.

Former adversary-hearing procedures—Before a hearing in personal injury cases in former years, the file of the Industrial Commission contained some usually adequate reports of attending physicians regarding the nature of the original injury and any surgical results thereof. However, these reports were generally

(Continued on page A-54)

*Inter-Mountain Clinic, Salt Lake City, Utah; †Chief, Traumatic Surgery Section, New York Hospital, New York, New York.

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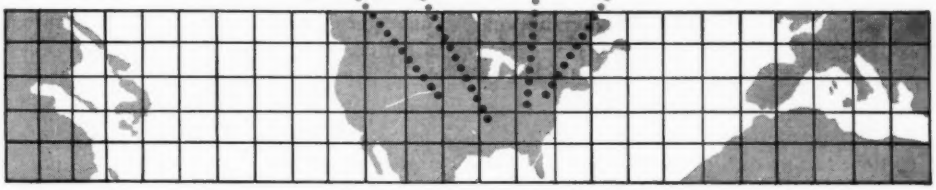

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far from adequate in regard to more remote effects of the injury; furthermore, there was no mechanism by which an inquiry could be made by a competent independent physician for the Commission. The general procedure was for the attending physician to meet before the hearing with the plaintiff's attorney, who tried to condition him to present the facts in the light most favorable to the plaintiff. At the hearing, the physician was expected to express opinions favorable to the plaintiff's claim for compensation. No matter how honest the attending physician, he found it difficult to escape bias due to his personal relation with the patient or his sympathy for the widow.

It thus became necessary for the insurance carrier to present a medical expert to controvert the opinion of the attending physician. Lest this testimony tip the scale too far in the other direction, the plaintiff then needed a medical expert. Despite the integrity of the medical expert, he, too, came to the hearing conditioned as a witness for one party to the proceedings. He was rarely furnished all the medical facts and then permitted to express an ordered logical opinion without interruption at the hearing. Rather, he faced a series of hypothetical questions from each side which were intended to obtain desired answers. The attempts of the opposing attorney to discredit and confuse the witness often resulted in making an honest witness become partisan.

Frequently, in medical testimony, an inequity existed in favor of the insurance carrier. The carrier was always ably represented by a skillful lawyer or claims adjuster, or both; often, the plaintiff was represented by a less skillful legal talent who was willing to accept a contingent fee frowned on by more established members of the profession. In addition, the insurance carrier was able and willing to pay an adequate fee for time spent by the physician at the hearing, while the plaintiff often could not pay the physician at all. An ethical physician charged the insurance carrier according to the time involved, regardless of the verdict in the case; however, the probability of the plaintiff's being able to pay any fee at all might depend on the outcome of the case. When such procedures were in effect, witnesses appeared who, according to Commissioner Wiesley,[2] "tailored their testimony, knowingly, to aid the cause of the party who called them as witnesses."

In spite of these practices, however, I believe that most doctors, lawyers and claims agents intended to be honest and fair. All were caught in a system that hampered and frustrated that intent.

Medical panel system—Choice of panel—Under the present system in Utah, there is a single panel of doctors who serve in litigation involving occupational disease. In cases concerning workmen's compensation, there are many medical panels, each chosen to fit the particular case. These panels are composed of specialists in various fields who are chosen by the Commission from a complete list of qualified physicians submitted by the Utah State Medical Association. The chairmanship of the panel does not change; however, membership rotates in order to assure uniformity of approach and expression of new viewpoints.[2] If any panel member finds that he has had previous relations with the claimant or has been consulted about the case, he automatically disqualifies himself. This system permits choice of the best-qualified specialists for a given case; it avoids an undue burden on the time of a few, and secures the support of a large segment of the medical profession.

Procedure—After setting forth conditions under which cases shall be referred to a medical panel and after defining qualifications of panel members, the Utah law[3] directs as follows: "The medical panel shall make such study, take such x-rays, and perform such tests, including postmortem examinations where authorized by the Commission, as it may determine, and thereafter shall make a report in writing to the Commission in a form prescribed by the Commission and shall make such additional findings as the Commission shall require." Thus, the panel is given wide authority, and it cannot be overemphasized that the law specifically directs the panel to make its own investigation and not to rely solely on the data supplied to it.

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(Continued on page A-56)

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member receives a formal order from the Commission and the panel chairman receives the complete original file on the case. Excessive routine procedures are avoided. The chairman writes to the claimant or to his lawyer, asking for specific information; a similar letter is sent to the attending physician, requesting amplification or clarification of reports on file and asking permission for the panel to review the hospital record. Cooperation in these procedures has been excellent. Insurance carriers often send photostats of all material on file; attending physicians reply to questions and send x-rays, laboratory data, electrocardiograms, etc.; frequently, they send the complete records of the case. A review of the hospital record by the panel is considered of great importance, as it shows in detail the exact sequence of events following the accident. The panel chairman summarizes the hospital record and, occasionally, brings it to a panel meeting.

To this point, the procedure is more or less routine, but it subsequently varies greatly with the individual case. It may be necessary to clarify certain discrepancies; the panel may direct that either the attending physician or other physicians make further examinations, the expense of which is paid by the Commission. Frequently, the panels on occupational disease and head injuries hospitalize patients for new x-rays, laboratory studies and even lung biopsies.

When the panel chairman is satisfied, after consulting other panel members, that the record is complete, he summarizes the original file and all new information, supplying copies of the summary to each panel member and to the Commissioner; a copy also is attached to the file of the Commission. After the complete file, including all correspondence and reports, has been studied by each panel member, the entire panel meets with the Commissioner for discussion. The claimant may or may not be examined by the panel at this meeting. Members of panels in orthopedic cases always examine the patient. The attending physician may meet with the panel, but he is not present during final deliberations. It has been found that a biased opinion of an attending physician disappears during discussion with panel doctors.

If the panel members reach a conclusion, it is recorded during the meeting for signature by all members and is returned with the file to the Commission. Decision may be delayed for further examination of the claimant or for study of the issues. The panel may wish to consult nationally known authorities outside the state. Occasionally, the panel is unable to resolve discrepancies regarding such matters as the exact nature of the accident, contradictory statements on the previous health of the claimant, etc. In such cases, the Commission is requested to hold a formal hearing on these matters, and the panel further deliberates on the transcript of this hearing.

Recently, medical panels have devoted more attention to positive efforts to return the claimant to self-support. This involves rating the degree and permanence of the disability in terms of any occupation. The panel may recommend that compensation be awarded for a limited period, at the end of which the case is open to review. This often results in the claimant's returning to work in the same or a different job. In other cases, rehabilitation retraining may be recommended.

Advantages of the panel system—The use of medical panels in cases involving personal injury results in more just and uniform decisions based on complete and impartial investigation and on unbiased expert medical judgment. Difficult cases, in which the claimant formerly could not have secured adequate investigation to support his claim, are now receiving equitable settlements. Unedifying adversary-oriented medical testimony and the professional medical witness no longer exist. The consistency of medical findings and decisions of the Commission have led to a marked decrease in the number of unreasonable claims filed with the Commission. The honest attending physician is no longer "on the spot." As Commissioner Wiesley stated, "Fear, suspicion, bias and hatred have been eliminated because expert honest medical opinion is now available to both parties at no cost to them."

According to Mr. Wiesley, there have been

(Continued on page A-58)

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†Yü, T. F.; Burns, J. J., and Gutman, A. B. Arth. & Rheumat. 1:532, 1958.

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approximately 300 reports from the panel on silicosis and approximately 150 reports under the accident compensation law since the medical panel system was instituted. None of these cases have been appealed on medical issues, although the law provides both parties the right to appeal within 15 days. Formal hearings by the Commission have been reduced from an average of 300 to 40 per year, including those requested by panels and cases on nonmedical issues. These facts indicate the wide support given the plan of medical panels by labor, industry and the medical and legal professions. Recently, the Utah State Medical Association Committee for Liaison With the State Bar Association suggested to its counterpart committee of the Bar Association that they jointly explore the possibility of extending some such medical panel system to district and federal courts.

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Statement by Dr. Wade:

PRESTON A. WADE

The average practicing physician or surgeon has had limited experience in court procedure and usually has a peculiar idea of methods involved in settling cases of personal injury. Most doctors have only vague notions about the operation of the courts, many of their ideas being based on a few unpleasant experiences while giving "expert testimony."

The young doctor who appears in court for the first time is always amazed by the long delays and the interminable testimony from seemingly unimportant witnesses regarding details that have no apparent bearing on the case. He discovers that the proceedings are ensnarled in confusing red tape that seems to bury the few significant facts that might possibly bring out the truth. Most of the principals involved seem intent on emphasizing the important points to their own advantage and on covering up possibly helpful facts brought out by the opposition. On many occasions, it becomes obvious that either one or the other of two witnesses is deliberately falsifying the facts. Furthermore, when he is finally put on the witness stand after a long wait, the physician finds that in the cross-examination his integrity is questioned and his professional ability attacked; he is placed in the position of making contradictory responses to tricky questions.

After a few appearances in court and one or two attempts to outwit a trial lawyer, the physician learns to confine his answers to medical facts and to leave the interpretation to others. He shares the layman's idea that the successful lawyer is one who wins a hopeless case, in spite of the facts, by his adroitness and cleverness in handling a jury, or, as stated by Joseph Welch, that "the successful lawyer is one who, by his magic, can sway a jury."

All of these impressions, ill-founded as they may be, have caused the average physician to avoid appearances in court if at all possible. Ethical physicians and surgeons have become unwilling to testify unless they are actually involved in treating the patient in the case. Thus, the average medical witness has not always been of the highest caliber, and his professional knowledge and ability have not always been adequate to serve the best interests of all who are concerned.

Because of these conditions, the responsible members of the medical profession in New York were gratified when the justices of the supreme court made an effort to clarify the situation and to expedite the outcome of personal injury cases. When a special committee of the Association of the Bar of the City of New York made plans to set up a panel of medical experts, it was found that most of the

(Continued on page A-60)

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doctors invited to serve accepted with enthusiasm and a spirit of cooperation.

Choice of panel members—A panel of 97 specialists was organized in New York County. Most of the physicians chosen by the committee for the medical panel hold professional rank in the various medical schools in New York or have comparable positions in the larger hospitals. All have achieved considerable reputations in their specialties. None of those invited to join the panel are regularly involved in medicolegal affairs, but all have had sufficient experience to understand the situation which precipitated the action. During the first two years of the experiment, all physicians accepted their assignments without question and were interested in learning the results of the new plan.

My experience as a member of the panel has been most gratifying. I found that all concerned accepted the impartial medical witness without reservation and did all they could to assist the medical expert to arrive at a decision promptly and with as little inconvenience as possible.

Procedure—The member of the panel is usually introduced to the case by the Medical Report Office, which acquaints him with the facts and indicates the differences of opinion and the particular discrepancies in the medical evidence that necessitate an impartial examination. This office may specify a medical point on which an impartial opinion is desired. An appointment is made for the physician to examine the patient; in the meantime, the Medical Report Office makes certain that the attorneys for the plaintiff and the defendant provide the examiner with all the medical data in their possession, including x-rays, photostatic copies of hospital charts, and doctors' reports. At the examination, the plaintiff is accompanied by his counsel; occasionally, an attorney for the defendant also attends.

In every case in which I have served, both the plaintiff and the attorneys have helped in every way to facilitate the examination. I have been able to question the plaintiff, obtain the necessary history, and make the required examination. If I determined that it was necessary to take x-rays in my office, I was able to do so. There was never any reluctance on the part of the client or his attorney, and the examinations were always carried out in the most informal and friendly atmosphere.

The report of the examination, similar to one that might be prepared for a referring physician, is submitted in triplicate to the Medical Report Office. As accurately as possible, it answers the questions which have led to the discrepancies in the medical testimony previously presented. After reviewing this report, the presiding judge may, if he chooses, call the examiner and informally question him further to clarify points which will help in making a decision.

There are no set fees for any given time or case. In most instances, the fees have been within reason. The policy of the Medical Report Office is to pay the fee asked by the examining doctor. If the fee is considered to be unreasonable, the panel member is not asked to take part in further cases.

It is inevitable that the panel expert be asked to appear to testify in some of the cases that go to trial. When I have been asked to testify, I have been extended every courtesy. At no time was my professional standing challenged, nor was there any attempt to imply that my testimony was anything but the truth. In most instances, I have been given sufficient notice and have been asked to appear at a convenient time; I have always been paid my usual fee.

Results—Investigation of the cases in which panel experts have participated shows that many early settlements have been effected; frequently, a more equitable settlement has been made than might have resulted if impartial medical testimony had not been requested. The early settlements of claims also have resulted in benefits to the injured person, since symptoms (whether real or imagined) often may be aggravated or even become chronic by long-continued litigation.

Results of a questionnaire on this plan, sent by the special committee to 15 panel members, indicated that the selection of specialists was satisfactory, that both plaintiff and defendant cooperated and assisted in the ex-

(Continued on page A-62)

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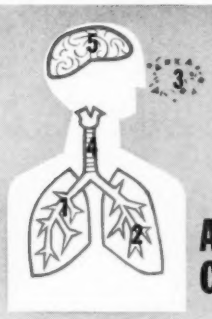

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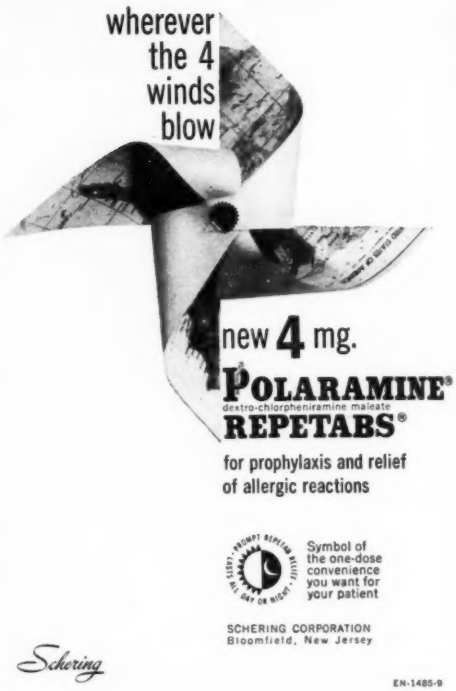
1. Personal communication. 2. Foland, J. P.: Postgrad. Med. 18:397 (Nov.) 1955.

amination, and that at no time was any pressure of persuasion exerted on the examiner. Each panel member indicated that adequate time was allowed for the examination and for the preparation of the report, that the office of the supreme court was extremely cooperative, understanding and helpful, and that the arrangements for the appearance at the trial were satisfactory. The interrogation by the lawyers of both sides was reported to be reasonable and productive, and the testimony was considered important and decisive in the outcome of the trial. Few panel members had any criticisms of the panel system or suggestions for its improvement. Many physicians on the panel were enthusiastically in favor of the system and believed that it would add greatly to the administration of justice in such cases.

From this pilot study, it is clear that the use of a medical panel in litigation involving personal injury is a significant forward step in the development of the system of justice in New York, and that adoption of this program on a national or state-wide basis would be advantageous to all concerned.



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The Gallbladder and Bile Ducts

NELS STRANDJORD†

University of Chicago School of Medicine, Chicago

After receiving his M.D. degree from the University of Chicago School of Medicine, Dr. Strandjord practiced surgery in Minnesota. He later served 35 months in the Medical Corps of the U. S. Army. In 1955, he began his training in radiology at the University of Chicago, where he has been an instructor since January 1, 1958. Dr. Strandjord is a diplomate of the American Board of Radiology.—Paul C. Hodges, M.D.

NELS STRANDJORD

THE introduction of iodine compounds excreted by the liver and concentrated by the gallbladder was an important milestone in medicine.[1] Improvements in contrast materials and radiographic technics have made this diagnostic procedure accurate and almost indispensable in diagnosing diseases of the gallbladder and bile ducts.

Visualization of the gallbladder depends on many factors—a patent gastrointestinal tract, adequate absorption from the small bowel, satisfactory function of the liver, patent bile ducts, and a gallbladder capable of concentrating bile.[2] A defect at any anatomic point or in any physiologic mechanism will result in nonvisualization of the gallbladder. Nonvisualization may result from such nonbiliary factors as failure to ingest the contrast material, emesis immediately after administration of contrast material, obstruction of the upper gastrointestinal tract, or diarrhea which prevents absorption from the small bowel. Jaundice with a bilirubin level greater than 3 to 4 mg. per cent, whether due to liver disease or obstruction of the common duct, renders the test valueless; obstruction of the cystic duct causes nonvisualization by preventing entrance of iodized bile into the gallbladder.

To obtain the best results, whether in the physician's private office or in the x-ray department of a hospital, a routine technic should be employed unless special circumstances require modification. A preliminary film is im-

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†Scholar in Radiologic Research of the James Picker Foundation.

FIGURE 1. Multiple, faceted, partially calcified stones in the gallbladder, with one stone in the cystic duct. Except for the contrast medium in the bowel, the appearance of this film is identical to that of a film made before ingestion. This was because the gallbladder was completely functionless.

portant, preferably a 14 by 17 in. film made with the patient in prone position. Frequently, diagnosis may be made from this preliminary film. Multiple faceted stones containing sufficient calcium to be visualized usually are easily distinguished from other calcifications such as kidney stones (figure 1). Large laminated stones are also easily recognized. When the cystic duct is obstructed, the gallbladder occasionally will be filled with calcium mud,[3] with or without radiolucent stones (figure 2). The obstructed cystic duct prevents entrance of iodized bile, and postingestion films are identical with the preliminary film. Less frequently, the wall of the gallbladder itself becomes calcified and can be identified (figure 3). Under these circumstances, the diagnosis can be made from the preliminary film. The region of the liver should be inspected carefully. When air can be seen in the biliary tree, it indicates fistulous communication between the biliary and gastrointestinal tracts (figure 4). Cholangiography with an orally administered contrast medium is not indicated in cases such as these.

FIGURE 2. Calcium mud and nonopaque stones in a nonfunctioning gallbladder with occluded cystic duct. a. A small amount of dense material in the gallbladder was seen in 1953. b. Four years later, the amount of calcified material in the gallbladder had increased greatly. c. Material removed at surgery was the so-called white bile. This is a poor term, however, because the material is not bile; it is calcium concentrated from the mucus which is excreted by the mucosa of the gallbladder.

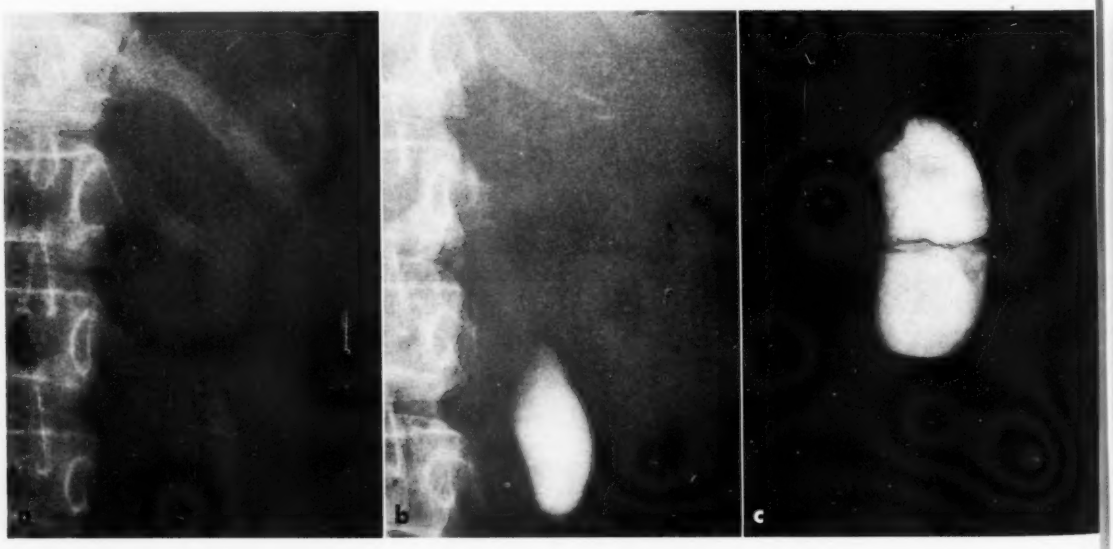

FIGURE 3. Nonfunctioning gallbladder with calcification of the wall and occlusion of the cystic duct.

FIGURE 4. Air in the biliary tree of a patient with a fistulous communication between the bile ducts and the duodenum. This film was made eight years following surgery for repair of the bile ducts.

Technic

Many satisfactory orally administered contrast materials are available; my own experience has been largely with TELEPAQUE®.* Three grams are given about two hours after a light, low fat supper, and nothing further is permitted by mouth until the examination is completed the following morning. The patient is questioned as to whether the tablets were taken as directed and whether emesis or diarrhea occurred. Our routine films are 14 by 17 in. stereoscopic prone views and a 7 by 17 in. nonstereoscopic right lateral view made with the beam of radiation parallel with the floor and perpendicular to the film. They are processed and viewed promptly; occasionally, additional films may be made.

In the horizontal beam, lateral view, the heavy, filled gallbladder sinks down toward the table top, and the light gas-filled loops usually rise toward the upper edge of the film. Nonopaque gallstones tend to assume a gravity level; sometimes, small stones, invisible in films of the prone position, show clearly in the horizontal beam, lateral view (figures 5 and 6).

Aside from improved diagnostic usefulness, this combination of stereoscopic prone views and horizontal beam, lateral views reduces the average dose of radiation to the tissue, because usually it establishes the diagnosis without the need of numerous additional films. Occasionally, layering of nonopaque stones or separation of the gas-filled bowel from the gallbladder requires spot films made with the patient erect. Nonvisualization on one examination should be confirmed by a repeat examination employing 6 gm. of contrast medium; even then the history must be considered in evaluating the clinical significance of nonvisualization. In one series, 20 per cent of nonvisualized gallbladders were normal at surgery.[4]

Specific Examples

The most common congenital anomaly is the phrygean cap (figure 7). In the infant or child, the clinical triad of intermittent jaun-

*Winthrop Laboratories, New York.

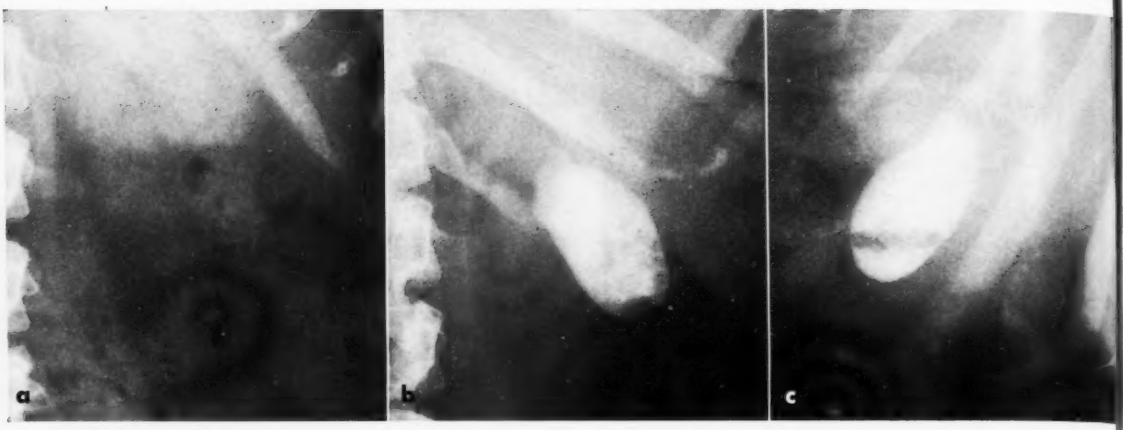

FIGURE 5a. Preingestion film showing no abnormal findings in a 48 year old woman who had chronic epigastric distress and nausea.
b. One of a pair of stereoscopic films in the prone position; normal visualization with multiple nonopaque stones.
c. Horizontal beam, lateral view showing separation between the shadow of the bowel and that of the gallbladder and layering of nonopaque stones.

dice, abdominal pain and palpable mass suggests the diagnosis of a congenital cyst of the extrahepatic bile ducts. The cyst may be demonstrated by cholangiography in which an intravenously administered contrast material is used (figure 8).

Rokitansky-Aschoff sinuses are being demonstrated with greater frequency with the more dense contrast materials now available (figure 9). These are epithelial sinuses which penetrate the muscular layer of the gallbladder and expand in the perimuscular or subserous layer. The surgical specimens usually demonstrate chronic cholecystitis, and the sinuses probably are caused by obstruction of the cystic duct.

FIGURE 6a. One of a pair of stereoscopic films in the prone position, made of a 48 year old woman who had epigastric distress, vomiting and clay-colored stools. Normal visualization; no stones seen.
b. Horizontal beam, lateral view. In the original film, layering of the small nonopaque stones was seen near the dependent border of the gallbladder. (This was barely discernible in the reproduction.)
c. Spot film on gastric-filming fluoroscope, made with the patient erect. The layering of the small stones is well seen.

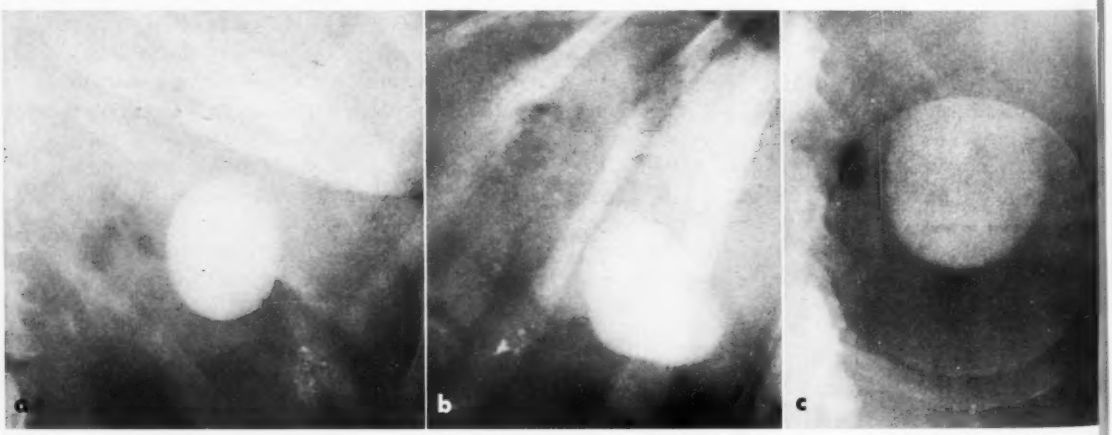

FIGURE 7. Phrygean cap gallbladder—a fairly common, clinically nonsignificant, congenital anomaly.

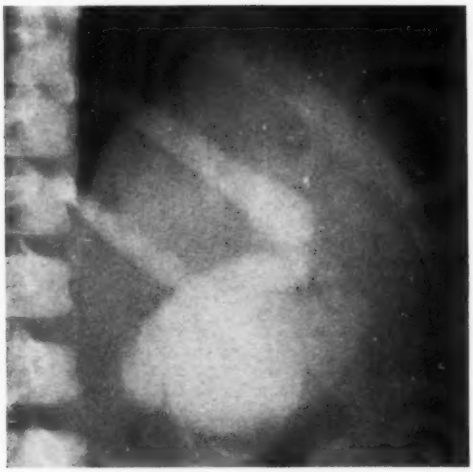

FIGURE 8. Congenital choledochus cyst in a three year old boy with a history of intermittent jaundice, cramping abdominal pain, and a mass which on palpation was thought to be an enlarged liver. Films of the upper gastrointestinal tract showed pressure on the duodenum from an extrinsic mass. The bilirubin levels were falling at the time cholangiography with intravenously administered contrast material was done, which probably explains the good visualization in spite of jaundice. The oval, 4 by 6 cm. mass is a large cyst communicating with the common duct.

Collections of cholesterol in the mucosa may become polypoid. The observation of a radiolucent mass which does not shift in the prone or lateral position should raise the question of a true polyp or a cholesterol polyp (figure 10).

FIGURE 9. Rokitansky-Aschoff sinuses in a 36 year old woman who had epigastric distress radiating to the back. Cholecystitis was found at surgery. It is believed that partial obstruction of the cystic duct results in the development of these sinuses.

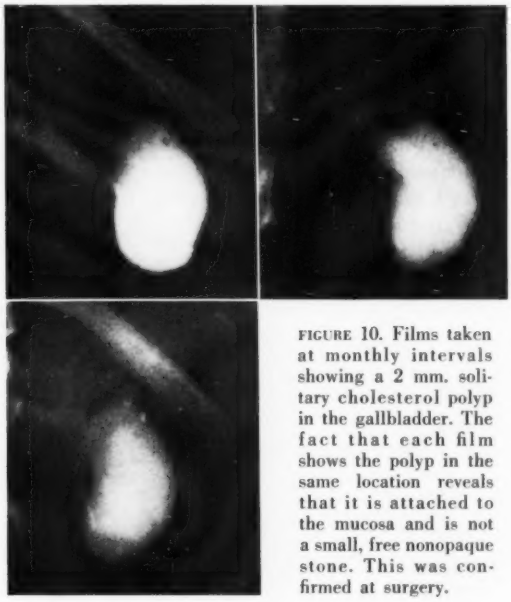

FIGURE 10. Films taken at monthly intervals showing a 2 mm. solitary cholesterol polyp in the gallbladder. The fact that each film shows the polyp in the same location reveals that it is attached to the mucosa and is not a small, free nonopaque stone. This was confirmed at surgery.

FIGURE 11. Cholangiography with intravenously administered contrast material in a 40 year old woman in whom jaundice developed 12 years after cholecystectomy. The jaundice was subsiding at the time of this examination. The film shows hepatic radicals and hepatic and common ducts. Some of the opacified bile is entering the small bowel, which indicates an absence of mechanical obstruction.

Cholangiography With Intravenously Administered Contrast Medium

Cholangiography with intravenously administered CHOLOGRAFIN®* is used in evaluating the bile ducts in patients with recurrent symptoms following cholecystectomy; it also is used preoperatively in cases in which there has been nonvisualization even on repeat examination with 6 gm. of Telepaque. If serum bilirubin is elevated above 3 to 4 mg. per cent, this type of cholangiography usually will fail. If the bilirubin is elevated but the level is falling, cholangiography may succeed, as in the case of the congenital choledochus cyst (figure 8). In postoperative patients with symptoms of biliary obstruction, the demonstration of a small duct without stone is clinically significant (figure 11). Much controversy remains as to the exact interpretation of the size of ducts following cholecystectomy.

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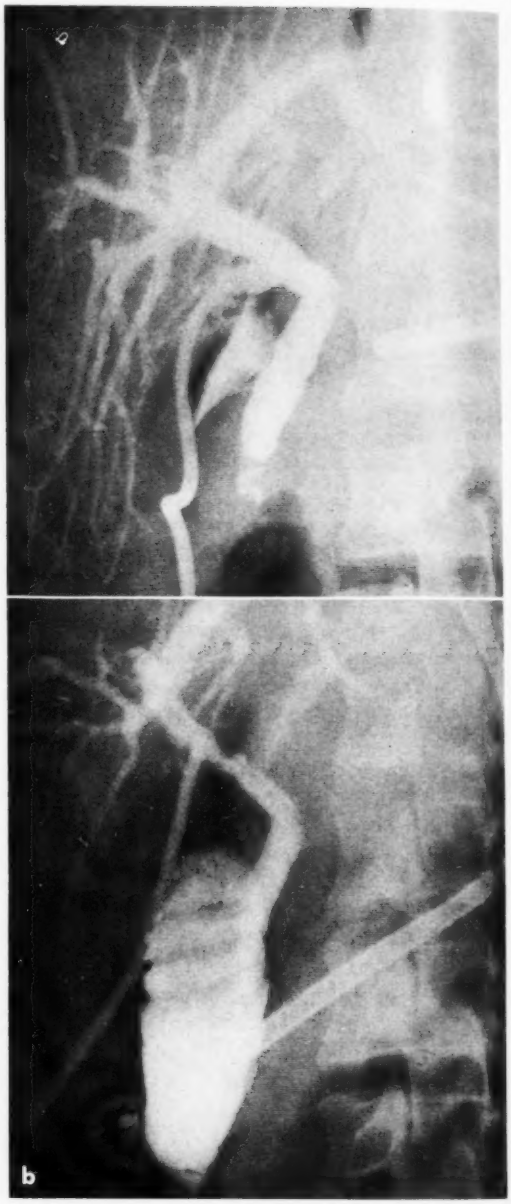

FIGURE 12a. Cholangiogram made during operation on a patient who had pain in the right upper quadrant, clay-colored stools, and dark urine. At cholecystectomy, no stones could be palpated in the common duct, but before the surgery was completed a cholangiogram was made through the T tube and stones were demonstrated at the lower end of the common duct. These stones were successfully removed. b. Appearance following surgical removal of stones.

Operative Cholangiography

During cholecystectomy, if the common bile duct is to be explored, operative cholangiography should be routinely performed to determine the presence of stones and patency of the duct system (figure 12).

Summary

In diagnosing disease of the gallbladder and bile ducts, cholecystography with proper technic is the single most important diagnostic tool available.

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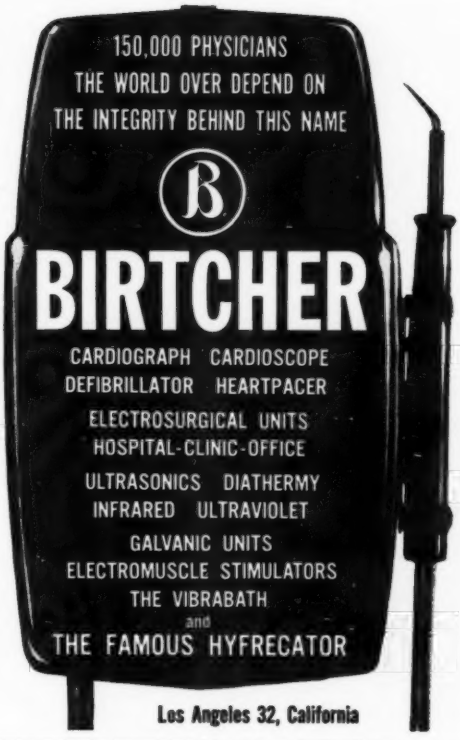

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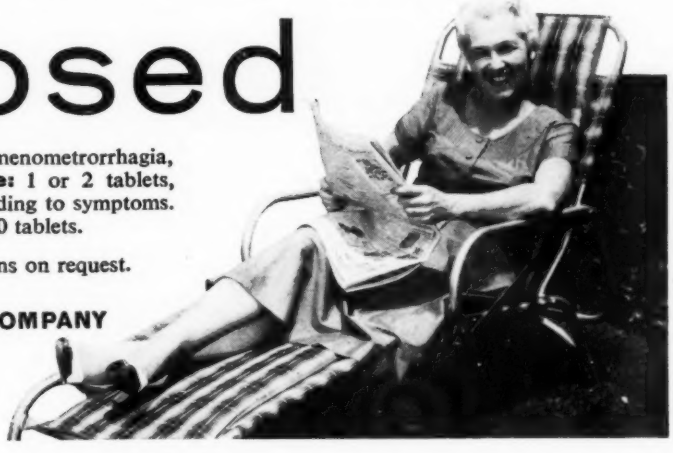

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Letters to a Medical Student

My dear son:

I am writing this letter on the Fourth of July, and the neighborhood, unlike Independence Day in my boyhood, is quiet; everyone has gone away in cars. We decided to stay at home—the propaganda about holiday traffic casualties was too frightening. I recall how I used to go to the lab on holidays, and how deserted it seemed. I thought there would be a few people around or, at least, that I wouldn't have to wake up the watchman. Perhaps today you are in a similar situation. Once you have foregone the picnic, be resolute. Start to work, and do it. When intensity of application seems odious, try to look at your subject as a hobby, something on which you are more informed than anyone else, and tinker around a bit on an amateur status. The long quiet days without interruption, when even the street traffic is stilled, are conducive to new ideas. Your "idea book" will come out, and into it will go enough plans for a year's work.

When you know you should spend the evening in study and you are trying to fight off calling that special young lady without whose presence life seems futile, take down the book with no resolution and with no more intention than to spend five minutes in looking it over. Soon you will be in the groove and hoping she doesn't commit the indiscretion of calling you.

Yet, if you really can't study, use the time for some routine task for which you feel too busy on work days, such as sorting your bibliography, arranging your reprints, cleaning out your desk. In a revamped office you will feel more like working. All these things count in the end, since they have to be done some time.

It is important to have the materials at hand if you are going to do creative work. When the artist gets an inspiration, he can't start shopping for a canvas of the right size, or go out and buy 10 lb. of modeling clay. The idea will have flown away when he returns. That is why it is well to buy the books you think you may want to use some day. Even though you never really use them, you have, in a sense, annexed their subject matter simply by possessing them. If you are wondering about the evolution of the ganoid cranium, you can't start out at 11 P.M. to buy a book on the subject. But if you have had the precaution to shelve a copy of Romer's "Vertebrate Paleontology," you

(Continued on page A-94)

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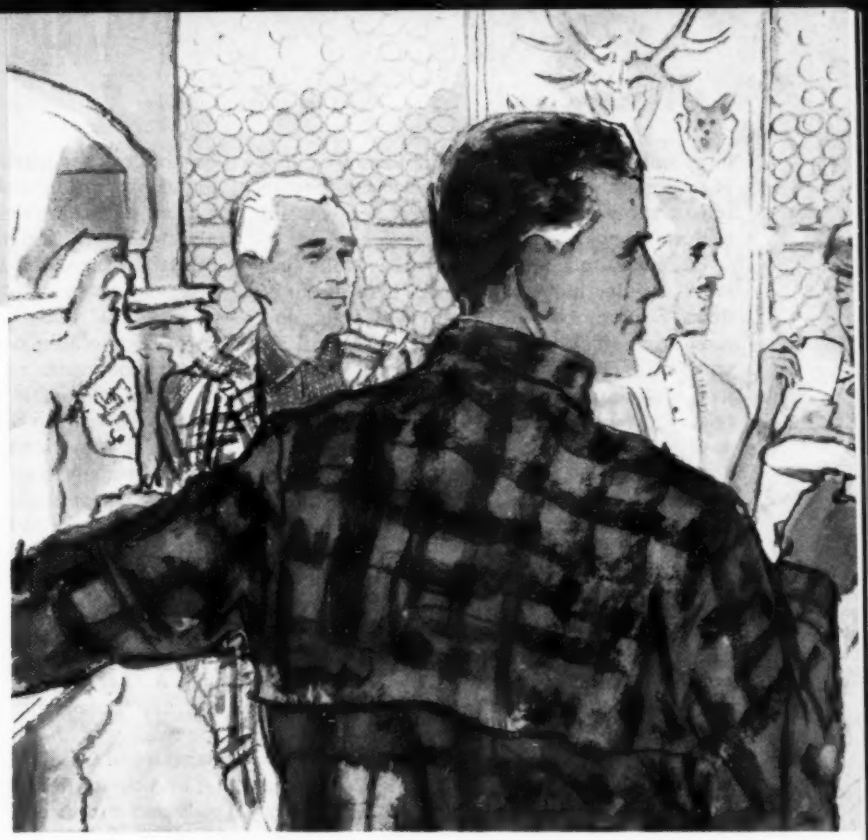

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Vitamin A	1,667 Units (0.5 mg.)
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Ascorbic acid	33.3 mg.
Nicotinamide	16.7 mg.
Vitamin B_2	0.67 mg.
Vitamin B_6	0.5 mg.
Vitamin B_{12} with intrinsic factor concentrate	0.033 USP Unit (oral)
Folic Acid	0.1 mg.
Choline bitartrate	6.67 mg.
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Ferrous sulfate (exsiccated)	16.7 mg.
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Taka-Diastase® (Aspergillus Oryzae Enzymes)	20 mg.
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Methyl testosterone	1.67 mg.
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dosage: One Kapseal three times daily before meals. Female patients should follow each 21-day course with a 7-day rest interval.

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have only to pull it down. In fact, that line of argument is the best I know to justify to self or spouse the purchase of expensive and tempting books.

Patience and excitement—the well-regulated intellectual worker will hive both of these. Sometimes a new vista will open, and the divine afflatus at the Pisgah sight will fill your being so that you cannot sit still and just work. Yet, such an idea must furnish grist for many a day's grinding. Day after day you will come to your laboratory or to your writing desk with nothing more in sight than a few more pages of words or a column of figures. Most worthwhile works are large nowadays, and you can never rise above mediocrity merely by dazzling in brilliance. You also must overwhelm in magnitude.

In your work you will have to do a great deal of reading; and the demands of your work, particularly in your earlier years, will protect you sufficiently from desultory reading. The very fact that you must read so much necessitates your being careful about the reading you don't need to do. Perhaps you should not be reading at all when it is not demanded by your work or development. It is too much like the proverbial busman's holiday. You should do something else. Executives and important political characters are often reported to read detective stories. For them this is a change. It enables them to sit still and have someone else carry their minds along. However, this is not for your kind of life. As a rest from your work, you will need life, activity, society and the diverting influence of a woman.

Too much time is wasted reading newspapers. The entrepreneur and the speculator must read them—but not the researcher. In the trains and buses in the morning "nearly everyone" reads a newspaper, and again in the evening the same crowd reads a still newer newspaper. This apparently goes on into the evening. Every detail that can be gathered is published and read, not to speak of trivia, sports and crimes. A flurry in Algeria or Vietnam is eagerly conned and tensely followed, yet we have never been there and have no friends there. We criticize the State Department as though we were party to their secret information. Wherever I go, I find that the men in charge are doing their jobs well and conscientiously. Anyway, what can you or I do about the world situation? I hate the feeling of frustration, so I try to confine my attention to situations that I can alter—ignorance about the cerebral cortex and the condition of my back yard. I am told that I must have information to vote properly, but if it takes hundreds of hours of preparation to choose between two men, neither of whom I like, it is costing too much.

I usually confine myself to the headlines that I can read in the paper belonging to the man in the seat ahead and to some reading in the news magazines. As long as there are fine books of permanent value which I haven't read, I will stick to books and journals.

But there is another side to the problem of ill-considered reading. In your work, facts, thoughts, ideas and attitudes are your stock in trade. They are your raw materials. You dress and package them into finished products. A master of an art must be careful of the raw materials that he uses and must see that the quality of the finished product equals the standard of the guild. The tinkerer, the hobbyist and the duffer can use substandard materials and produce substandard results, but it is the responsibility of the professional intellectual to develop the thought of the world. This is a difficult, highly discriminative and artificial process, and it requires much husbanding and many props. You should be careful of what goes into and what comes out of your mind, for it is your only commodity. Diversion can be as unintellectual as you wish, but you should not be petty in your thinking. Reading important books, confining your thoughts to significant subjects and keeping that precious leaven—conversations with colleagues on elevated subjects—are all methods of insuring this. There are countless amateur politicians, civilian strategists, armchair coaches and archivists of athletic events. They are in oversupply, and you are not needed. Leave the field to them. They will take care of it very well; the world doesn't need your efforts in that direction. But there are so few who have the elaborate and specialized training to develop the thought of the world. You are needed there. Everyone lost to trivialities in converse and thought is wasting his patrimony, is a traitor to his caste. That is why I think it is a pity when several professors, each eminent in his department, meet at luncheon and talk about the world series. Conversation

in any group should develop the highest common multiple, not the least common denominator. I do not mean to indict the fine art of light conversation, humor, learned foolery or badinage. Talk need not be heavy and technical. Good conversation is a fine art, a delicate thing to bring off properly. It is one of the last skills to be mastered, reflecting true culture more than any one criterion, and one of the last remnants of grace in living in our laconic civilization.

Let me close by echoing Chesterfield, who in his letters to *his* son repeated, "The graces! The graces!"

And so, good night,
Father

* * *

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He spends a small fortune and many a year,
Preparing himself for his chosen career;
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Awaiting the day he can hang out his shingle;
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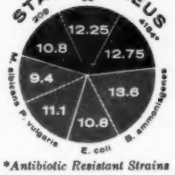

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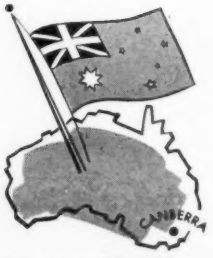
Medicine from Abroad

FROM POSTGRADUATE MEDICINE'S CORRESPONDENTS

AUSTRALIA



Corpus carcinoma—In the *Australian and New Zealand Journal of Surgery*, Dr. Barry Kneale of the University of Melbourne reviewed 245 cases of corpus carcinoma seen between 1943 and 1956. The patients were between 27 and 83 years old, with an average age of 58. Adeno-acanthoma was present in 25 per cent of the cases.

Five year survival was obtained in 38 per cent of the patients treated with intracavitary irradiation alone; occasional patients survived as long as 10 years. The five year survival rate after conservative surgery was 70 per cent, and a few recent cases seemed to indicate that intracavitary irradiation and subsequent radical surgery will give the best results. The operative mortality in 58 patients who had a Wertheim hysterectomy was 7 per cent; the incidence of urologic complications with this operation was much lower than that seen in similar surgery for cervical cancer. At autopsy, metastases from lymph nodes were predominantly para-aortic. In this series, the incidence of involvement of lymph nodes was greater in growths located near the cervix and in those exhibiting squamous cell differentiation.

Pilonidal sinus of the axilla—Professor E. S. J. King of the University of Melbourne stated in the same journal that there are differences of opinion as to whether pilonidal sinuses are congenital or acquired. Professor King considers the evidence that such lesions are acquired to be irrefutable; he believes that the site of sinuses found in the axilla supports this theory.

Sinuses may be formed by suction resulting from pressure changes in the depths of a sulcus or a crease during movements of adjacent tissues. The suction draws material deep into the sulcus and into any cul-de-sac which may be present. Tips of hair grow deep into the sinus, and in some cases the roots also are deeply situated. Extraneous materials such as sheep's wool and hair from cattle and dogs have been found in sinuses located in the interdigital region of shearers' hands.

The author described a granuloma which was found at the fundus of an axillary sinus and which was caused by talcum powder. This lesion illustrated the manner in which the sinus developed and the external origin of the material within it. Because of these findings, Professor King is surprised that so many still believe that such lesions are of congenital origin.

Weights and measures in medicine—According to Drs. P. N. O'Donnell and Berta Ungar of the Royal Melbourne Hospital, careful planning and the cooperation of the hospital staff will facilitate the introduction of the metric system of weights and measures in medicine. Although each section of the hospital will experience its own

(Continued on page A-98)

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particular difficulties, explanation rather than direction will secure a more cooperative response. The authors stated that the method used at the Royal Melbourne Hospital could be expressed as the following simple prescription: Take an enthusiastic and cooperative medical staff, one which has foreseen the introduction of such a system and which has had the pharmacopeia printed in the metric system. Tutor the resident medical and nursing staffs q.s. Print new medical labels and temperature and fluid balance charts. Add a metric conversion table. Purchase measuring vessels, centigrade thermometers, yardsticks and glasses for medicine which have metric measurements printed on them. Adjust scales so that they measure metrically. Mix gently in the pharmacy. Pour into prepared vessels. Swallow the draught overnight.

This report appeared in the *Medical Journal of Australia.*

AUSTRIA

Treatment of uterine carcinoma—At a meeting of the Austrian Society for Gynecology and Obstetrics, Drs. F. Brandstetter and A. Kratochwil reported on the results of treating 2400 patients with uterine carcinoma at the second gynecologic clinic of the University of Vienna between 1934 and 1953. Their material was grouped under the following headings: age of patient, grade of disease, morphologic appearance, and method of treatment. Complications produced by the various therapeutic methods, direct operative mortality, and frequency of relapses also were considered. The statistics showed a definite increase in the number of cures during this period, which was attributed to the work of Professor H. Zacherl, present director of the clinic.

The speakers emphasized the inadequacy of classifying carcinomas of the uterine cervix by stages. In addition to the ordinary grading of surgically treated cases, the spread of the tumor as determined by histologic examination of the specimen that is excised at operation should be considered.

In the discussion that followed, Dr. E. Navratil reported the results obtained during the period 1946 to 1953 in treating uterine carcinoma at the gynecologic clinic of the University of Graz. During this time, 570 of 1,338 patients (42.6 per cent) treated by operation or irradiation were cured. A five year survival was obtained in about 50 per cent of women treated in 1953 for grades 1 to 4 squamous cell carcinoma. The percentage of five year cures effected by surgery was more than double that effected by irradiation. In 1946 the rate of cure was only 31 per cent.

In discussing the operative treatment of corpus carcinoma, Dr. Navratil referred to Dr. Buudwijk-Bastimanse's proposal that a small gauze strip, soaked in alcohol, be introduced into the uterine cavity and the cervical canal immediately before operation; the edges of the external orifice of the uterus would then be carefully sewed together. This procedure should be done in both the vaginal and abdominal operations. The removal of a vaginal cuff is indicated in both operations in order to prevent local recurrences.

The vaginal operation is especially indicated in treating corpus carcinoma, since a laparotomy places a greater strain on the patients, who are usually in the older age groups and who frequently have other internal disease. On the other hand, the abdominal operation enables the surgeon to ligate the fallopian tubes immediately after laparotomy and to clear the lymphatic areas if necessary. It is not feasible, however, to excise the lymph nodes routinely, since general complications frequently develop. Furthermore, it is questionable that total excision of lymph glands would substantially improve the over-all results. Improvement can be expected only from earlier detection of the carcinoma.

In regard to the grading of squamous cell carcinoma of the uterine cervix, Dr. Navratil stated that further subdividing of grade 1 would result only in "sham accuracy." He observed that grading should be established on the basis of a precise clinical examination, and bimanual palpation should be done under general anesthesia. Furthermore, he suggested that surgically treated cases might be graded separately on the basis of results obtained by histologic examination of the excised material.

Professor Zacherl reported that Wertheim's operation is superior to Schauta's operation in cases of more advanced carcinoma of the uterine neck. He observed that an increase in the rate of cure can be expected in the future if radical operations include compulsory clearance of all approachable areas containing lymph nodes. Pro-

(Continued on page A-100)

In skeletal-muscle disabilities . . .

Curbs spasm, relieves rigidity, and relaxes psychic tension

Of all muscle relaxants in current use, only meprobamate is supported by hundreds of published clinical studies that demonstrate relaxing action on both the brain and the skeletal musculature. EQUANIL reduces muscular spasm and tension, aids in the restoration of mobility, speeds rehabilitation, lessens the emotional overlay.

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fessor Zacherl considers grading very important in cases of cervical carcinoma. In addition to the ordinary grouping into stages or grades, he and other surgeons insist that the histopathologist give an objective classification of surgically removed material. This latter classification enables surgeons to compare operative results. Zacherl and co-workers believe that laparotomy, wherever possible, is the method of choice in corpus carcinoma. He reported that he had often observed malignant lymph nodes which would have been missed at vaginal operation in patients with corpus carcinoma.

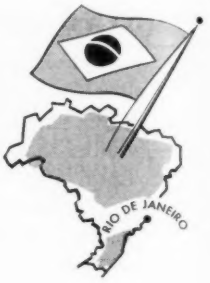
Dr. E. Schüller stated that a study of surgical specimens obtained by radical operation for carcinoma of the uterine cervix showed that the majority of cases of grade 3 carcinoma had been falsely interpreted. Carcinomatous infiltration of the parametrium as far as the pelvic wall was found in only one of the cases designated grade 3 by the clinicians. That such a sizable error in grading can occur should be considered in interpreting statistics pertaining to carcinoma.

Dr. H. Högler reported on results obtained in treating uterine carcinoma at the gynecologic clinic of Gersthof between 1945 and 1953. A relative cure was obtained in 70.04 per cent of the patients operated on by the Schauta-Amreich method and in 48.81 per cent of those operated on by the Wertheim method. An absolute cure was obtained in 57.28 per cent of all patients, including those who had been treated only with radium and roentgen rays.

Dr. J. Froewis reported that a ruling had been passed at the meeting of the Austrian gynecologists in Graz in 1958 which established that in evaluating the data on the curative results of surgery the true grade of the tumor should be given in addition to the clinical classification. At present, the compulsory excision of lymph nodes makes it possible to detect the true grade of carcinoma without serious difficulty. At the jubilee session of two Viennese gynecologic clinics, the members were able to designate those lymph nodes which probably had been invaded by carcinoma in about 10 per cent of cases of grade 1 carcinoma and in about 30 per cent of cases of grade 2 carcinoma. Froewis reported the following percentages of five year cures obtained in 157 patients in whom the lymph nodes were excised: grade 1, 85.26 per cent; grade 2, 75 per cent; and grade 3, 46.68 per cent.

Dr. T. Antoine mentioned that the newly proposed international grading system should eliminate incorrect evaluations of the parametrial tissue, since only the roughly nodular infiltrations would be called grade 3.

BRAZIL



American leishmaniasis—The results of using sodium stibogluconate to treat American leishmaniasis in seven patients were reported by Tancredo A. Furtado, Zigman Brener and Geraldo Batista in *O Hospital*. One patient had mucous leishmaniasis; two had the cutaneous type, and four the mucocutaneous type. After 10 to 15 intravenously administered doses of the drug, lesions of both the skin and the mucous membranes were completely healed in six of the patients and partly healed in one patient who had the mucocutaneous form of the disease. The authors reported that response to the drug was rapid and that no side effects were noted.

Acute puerperal inversion of uterus—In *Revista de gynecologia e d'obstetricia*, Ary Novis reported a case of acute puerperal inversion of the uterus, a condition which he believes occurs rarely. Diagnosis is not difficult; the signs are an exteriorized uterus, shock, hemorrhage and discomfort.

Prophylaxis is based on avoiding uterine atony, which the author considers to be the fundamental underlying cause of inversion of the uterus. Trauma also frequently causes this condition. Bipolar taxis is generally the best method of correcting the inversion; uterine tamponade is no longer used. When the placenta is still attached, the author prefers to use manual detachment, followed by bipolar taxis. If these procedures fail, the Huntington operation should be performed.

"Familial amyloid polyneuropathy"—In *Jornal brasileiro de medicina*, Antonio R. de Mello analyzed reports of atypical generalized primary amyloidosis, emphasizing those concerning amyloidosis of the nervous system. He discussed the work of Corino Andrade, a Portuguese neurologist who studied an unusual form of generalized primary amyloidosis affecting particularly the peripheral nervous system. This dis-

(Continued on page A-102)

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References: Batterman, R. C., et al.: New York J. Med. **58**:3821, 1958. / Harrison, T. R.: Principles of Internal Medicine, 3rd ed. McGraw-Hill 1958, Pg. 1764. / DiMascio, A., et al.: Am. J. Psychiat., **115**, 301-317, 1958. / Sainz, A.: Proc. of Mohawk Valley Psychiatric Assn., June 17, 1957. / Fleischmajer, R., et al.: Antib. Med. & Clin. Therap., **5**, 120-124, 1958. / Hoekstra, J. B., et al.: J. Am. Pharm. A., **42**, 587-593, 1953. / Cronk, G. H. and Naumann, D. E.: New York J. Med., **55**, 1465-1467, 1955. Paper in preparation: data on 500 clinical cases available on request.

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ease has a marked familial incidence and is often found among the population of the coastal regions of northern Portugal. Its chief clinical symptom is a progressive sensory-motor paralysis with crural dominance, and it produces flaccidity, amyotrophia and areflexia. Other symptoms are digestive disturbances, sphincteric disorders and reduction of sexual potency.

In histopathologic studies of the peripheral nervous system, special staining methods were used to visualize the amyloid substance. Neurogenic muscular atrophy and the so-called granular change of the muscle fiber which is characteristic of primary muscular atrophy also were present.

In discussing diagnosis, the author differentiated this disease from tuberculoid leprosy; syringomyelia; amyotrophic tabes; Déjerine-Sottas disease; Charcot-Marie-Tooth disease; the deficiency, metabolic, toxic and infectious polyneuropathies, and tumors of the cauda equina. He suggested that because the amyloid substance is found on the multiple peripheral nerves in Portuguese amyloidosis, the condition should be designated "familial amyloid polyneuropathy." This term would indicate its clinical, pathogenic and familial aspects.

ENGLAND

Peptic ulcer and partial gastrectomy—Before the twentieth century, peptic ulcer appears to have occurred rarely, and duodenal ulcer in particular seems to have developed with the rush and hurry of modern civilization. Conservative measures have failed to control an increasing number of cases of peptic ulcer, and surgical intervention is required more often in treatment. Partial gastrectomy has become the standard operation, but the best technic to follow in this operation has never been determined.

Mr. Hermon Taylor, surgeon at the London Hospital and a well-known gastroenterologist, recently published in the *British Medical Journal* a comprehensive review of postgastrectomy syndromes. He related the frequency and severity of the symptoms which occur with the technic used in the operation. The postgastrectomy syndromes are caused by the anatomic and physiologic disorientations brought about by the operation. Surgical procedures which exclude the duodenum from the passage of food lead to a derangement of digestion and absorption by altering the time relationships of the secretion of the various gastric and intestinal juices. In gastroduodenal anastomosis, the anatomic disturbance is minimal; unfortunately, however, this operation should not be performed on patients with duodenal ulcer, because the increased secretion of acid by gastric remnant leads to a high rate of recurrent ulceration.

The nearer the site of anastomosis to the duodenum, the less likelihood there is of metabolic disturbance, and an operation that places the anastomosis as high as possible in the jejunum without any acute angulations of the bowel will minimize postgastrectomy complications. Mr. Taylor described a method of gastrectomy in which a tube of fundus is mobilized to reach down to an anastomosis at the muscle of Treitz. The creation of an afferent jejunal loop is thereby avoided.

New National Health hearing aid—One of the most striking items in the program of the National Health Service, which began in 1948, was the provision of free hearing aids, with free batteries as needed, for persons with degrees of deafness which hospital ear specialists determined could be helped by the aids. However, these aids were criticized as being outdated in design because of their weight (1 lb., 2 oz.) and because the heavy batteries were separated from the microphone. Nevertheless, the aids proved to be efficient and helpful in a wide range of varieties of deafness, and nearly a million of them have been issued. The Ministry of Health has now announced that a new hearing aid with transistors will shortly be available for adult deaf persons, children having been given priority. The new aid, with four transistors instead of vacuum tubes, is a single unit in a flesh-colored plastic case, with an earpiece molded to fit the individual user's ear. It contains a single small 1.5 V cell which lasts about three weeks, and it weighs only 3¼ oz. The old-type hearing aid will no longer be produced and eventually will not be in use.

Artificial menopause—In the *Practitioner*, Dr. Gladys Hill, gynecologic surgeon at the Royal Free Hospital, London, stated that the principal indication for inducing artificial menopause is dysfunctional uterine bleeding. This connotes ir-

(Continued on page A-104)

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regular or profuse uterine bleeding for which no cause can be found in the general health or emotional state of the patient and for which no pathologic lesion of the pelvic organs is found on clinical examination. Microscopic examination of the endometrium after curettage and of the cervix after biopsy must be conducted, and cytologic tests should be made to determine whether or not malignant cells are present.

Dr. Hill observed that the artificial menopause may be induced either by hysterectomy, with or without bilateral salpingo-oophorectomy, or by irradiation with x-rays or intra-uterine radium. The general condition of the patient, which may preclude major surgery, must be evaluated before deciding on treatment. In women less than 45 years of age who show no sign of approaching the natural menopause, hysterectomy with conservation of the ovaries is the treatment of choice. Greater mortality and morbidity are offset by the permanence of the cure. In women of 45, and particularly in those nearing 50 years of age, x-ray treatment must be given very serious consideration. The immediate risk is minimal; the likelihood of permanent cure is high, and the chance of severe postmenopausal symptoms is not great. However, in younger patients, postmenopausal symptoms are most severe when the ovaries are either removed or directly attacked by x-rays. If the patient has reached the age at which normal menopause occurs, postmenopausal symptoms are no more severe when the menopause is artificially induced than when it occurs naturally.

FINLAND

Medical findings and vocational guidance—In *Duodecim*, A. M. and H. A. Salmi stressed the importance of medical examination in vocational guidance. They reported results of a study of 2,115 pupils from the upper grades of secondary and elementary school who had received counseling from the Municipal Bureau of Vocational Guidance in Helsinki. The authors studied the medical reports of the pupils and the data showing their occupational aspirations and social backgrounds. The objective findings of medical examination were analyzed, and their incidence was studied in relation to the type of school attended, sex, mother tongue (Finnish or Swedish), and occupation of the family breadwinner.

Examination revealed a specific pathologic finding in 47 per cent of the students. The healthiest pupils were boys in secondary schools who spoke Finnish. The most frequently observed pathologic findings were lesions of the skeletal structure and the motor apparatus, ocular and auditory disturbances, and symptoms of dystonia.

In 5 per cent of the cases, the occupational aspirations of the pupils conflicted with the medical findings. Diseases of the skeletal structure and motor apparatus and allergic manifestations caused more conflict than did other conditions. The incidence of conflict was higher in elementary school pupils than in the other group. No significant differences were seen when the pupils were classified according to mother tongue, sex and social background.

Drug addicts and alcohol—After studying alcohol consumption in 229 drug addicts, Dr. A. Westling reported in *Duodecim* that almost three-fourths of the men and about one-fourth of the women had consumed alcohol heavily before the onset of drug addiction. Alcohol ingestion decreased and almost disappeared when addiction was established.

Many of the patients had first taken drugs to mitigate the aftereffects of drinking; relapse after hospital treatment often occurred for this reason. The author found that the less intensive the use of alcohol before drug addiction, the more often drugs were first taken on medical advice. The criminologic prognosis was more favorable in these patients than in those who had previously indulged heavily in alcohol and had subsequently taken drugs merely to achieve euphoria.

The majority of the addicts studied, including those under hospital treatment, had been punished for vagrancy. A considerable proportion of addicts are guilty of the illicit sale of liquor; in Finland this appears to be an important source of financing drug addiction.

These findings seem to suggest that in certain communities alcohol ingestion may be a strong incitement toward drug addiction, which often represents only a change in the nature of addiction. The study also indicates that the use of alcohol prior to drug addiction may be significant in considering the sociologic and criminologic prognosis of the addict.

Acute pancreatitis—Drs. M. Siurala and P. Härkonen reported the results of studying 53 men and 69 women with acute pancreatitis (acute abdominal distress and urinary Wohlgemuth values of 256 or higher). The mean age in this group

(Continued on page A-107)

was 5[illegible] years; 60 per cent of the patients were more than 50 years old. The incidence of the disease in women increased with age, while the greatest incidence in men was in the 30 to 50 year age group.

Biliary tract disease was found in 56 per cent of the patients (68 per cent of the women and 34 per cent of the men) and in 83 per cent of the men more than 60 years old. Seventeen per cent of the total number of patients and 63 per cent of the men 30 to 50 years old had consumed considerable amounts of alcohol over a long period, but none of the women or the men more than 60 had used alcohol. Seven patients either had peptic ulcers or had had them previously.

In 18 per cent of the patients, the pancreatic attack began in connection with ingestion of considerable amounts of alcohol; the attack occurred in another 18 per cent after ingestion of a fatty meal. Three patients had an attack after x-ray examination of the gallbladder; in one patient the attack occurred after x-ray examination of the stomach. Abdominal operation preceded pancreatic attacks in two patients. All patients had pain and nausea, and 80 per cent had episodes of vomiting.

On an average, the high urinary Wohlgemuth values normalized within three and one-half days, and lower values were noted within one day. An elevated erythrocyte sedimentation rate occurred in most patients; in 66, it remained high for more than one month. Leukocytosis was present in 74 per cent of the patients. Pronounced leukocytosis and a slower normalization of leukocyte values and of the erythrocyte sedimentation rate were seen more often in patients with concomitant biliary tract disease than in others. The icterus index was high in 62 per cent of the patients, chiefly those with biliary tract disease. Glucosuria appeared in 21 per cent and albuminuria in 19 per cent; these conditions were noted especially in cases of severe pancreatitis.

Eleven (11 per cent) of the conservatively treated patients and 5 (23 per cent) of the surgically treated patients died. Follow-up of 80 patients showed that 20 had a relapse of acute pancreatitis; six had more than one relapse. Relapses occurred in more than 50 per cent of the patients who used alcohol, but patients with surgically treated or untreated biliary tract disease had relapses relatively seldom. Relapses were more common in patients with persistent biliary tract disease than in those in whom cholecystectomy had been

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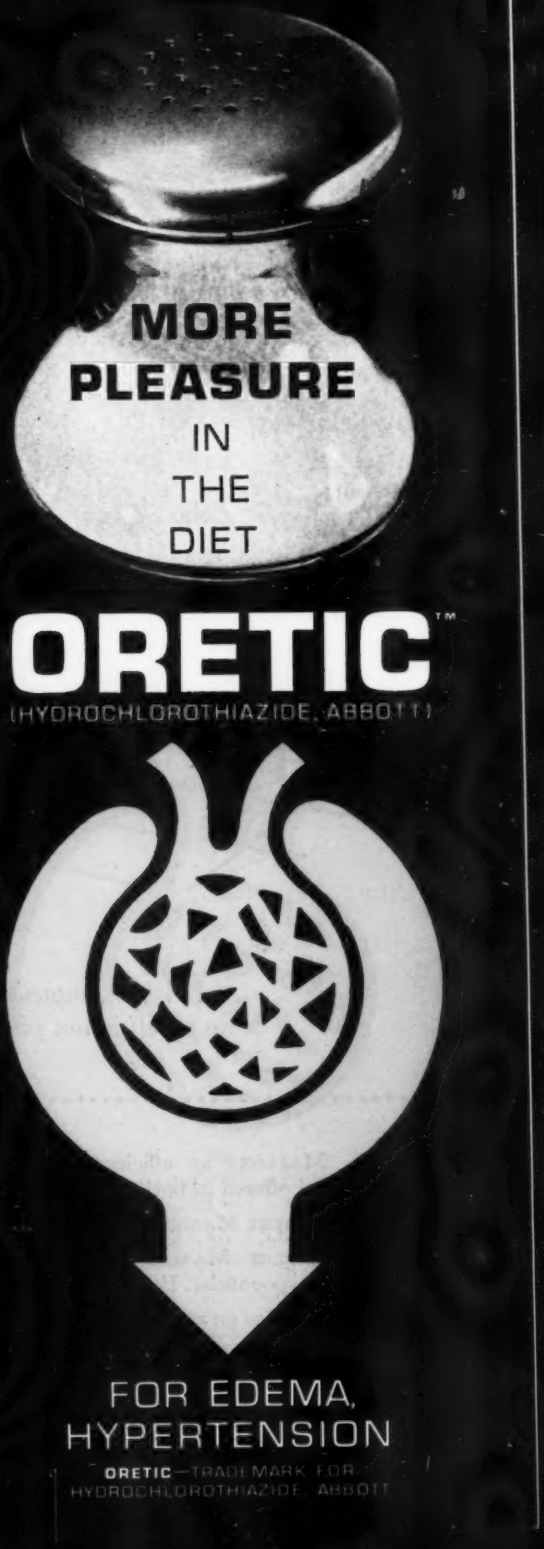

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performed after the first attack of pancreatitis. In patients who used alcohol, the relapses always occurred after they had had considerable amounts of it. Two patients had a relapse after ingestion of a radioactive fatty meal. Of 40 patients followed by the authors, only 14 were symptomless; the remaining ones had various types of abdominal distress. Fecal analysis revealed considerable amounts of neutral fat in six patients. Four of 35 patients showed markedly impaired absorption of I^{131}-labeled olive oil.

Latex fixation test in rheumatoid arthritis—J. L. Kalliomäki and E. Rubinstein used the latex fixation (Hyland RA) test in a study of 106 patients with rheumatoid arthritis and 104 control patients. Results were positive in 68 per cent of the patients with rheumatoid arthritis. In the 48 stage 1 and stage 2 cases, the test was positive in 44 per cent; in the 58 stage 3 and stage 4 cases, it was positive in 86 per cent. In the group with rheumatoid arthritis, the erythrocyte sedimentation rate did not appear to be definitely related to either a positive or negative test result. Twenty-seven patients with rheumatoid arthritis also were examined by the hemagglutination test, modified by Svartz-Schlossman. The latex fixation test gave positive results in 20 of these patients; results of the hemagglutination test were positive in 15 patients.

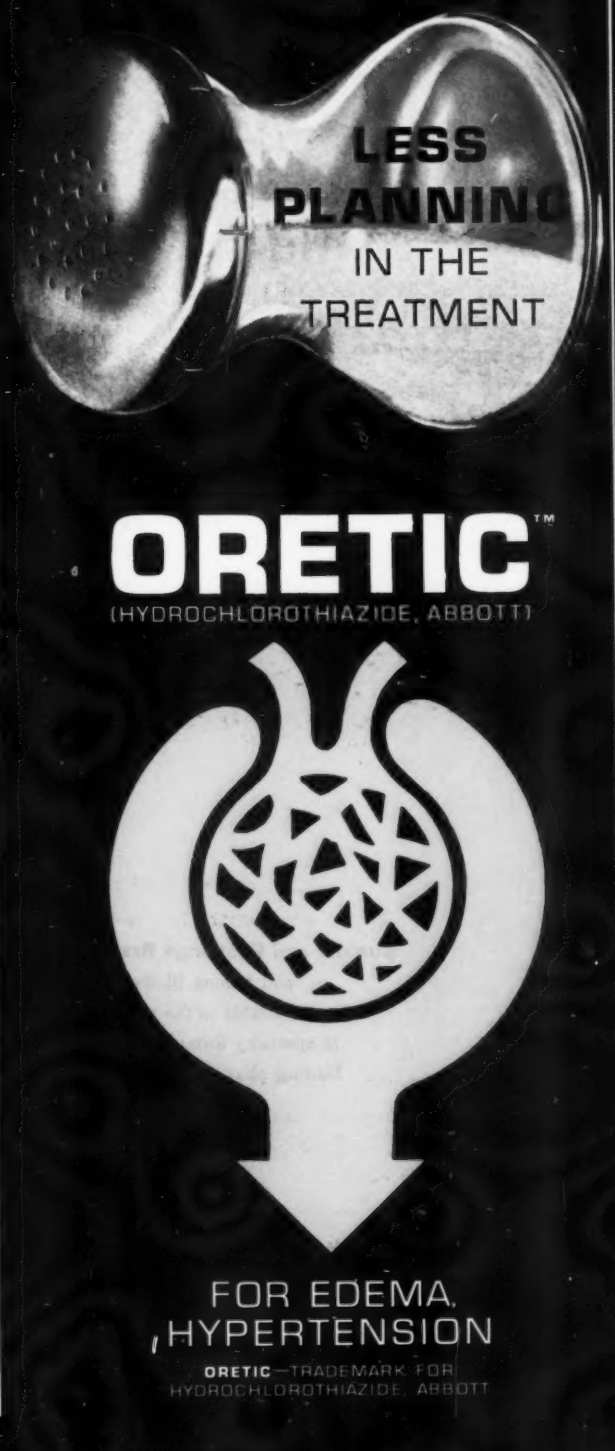
Conditions in the six control patients in whom a positive result was obtained included preeclampsia, cholecystitis with pancreatitis, and bronchitis.

Fine granular agglutination was present in 35 of the patients with rheumatoid arthritis and in 41 of the control patients. Therefore, the authors emphasized that weak reactions should not be taken into account, since their diagnostic importance is highly questionable.

FRANCE

Debates and reforms in medicine—In spite of vehement criticism by some physicians, De Gaulle's government is planning to make profound changes in the system of teaching medicine. The plan was designed by Professor Debré, director of the International Childhood Center and consultant for the government. Its essential

(Continued on page A-111)



IN STRESS CONDITIONS SUCH AS:

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feature is the designation of all the medical chiefs of the services in towns with medical faculties, together with their assistants, as medical civil servants who will work full time in hospitals. Those without professorial titles will be associated with the teaching system as "masters of public lecture"; their time will be divided among caring for the sick, teaching, and doing scientific research work.

Such an organization does not give these physicians a chance to receive their private patients in special medical offices; outside the hours of official service, they are authorized to call on only those patients for whom a medical practitioner has asked them to serve as consulting physicians. However, since their civil service salaries are not sufficient, they are allowed to receive private patients at the hospital twice a week and to hospitalize some of these patients there.

At present, physicians in French hospitals are drawing practically all of their income from their private patients; only a small portion comes from their hospital salaries. In the proposed plan, no increase in funds has been provided, and the budget may be reduced whenever the ministers wish. Thus, the prospect of becoming civil servants does not please the older physicians who own well-equipped offices and have large practices which must now be abandoned. However, the project meets with the approval of the younger physicians who as yet have few or no private patients.

The reform also includes a plan to increase the number of professorial positions in several hospitals where architectural adjustments will be made. This proposal will result in better teaching, in reduction of the number of students per professor, and in the avoidance of loss of time in transportation, which is a problem in the Paris region.

Other proposals concern current medical practice. In France, medical fee tables are available, related to the social security system. In principle, 80 per cent of the medical fee is reimbursed to the patient on the signature of the physician. The reimbursed sum formerly was 320 francs (65 cents) for a visit, 200 francs (40 cents) for an intravenous injection, etc. The fees gradually increased until the patient got back no more than 40 or 50 per cent of his medical expenses. Agreements with the medical syndicates of the various departments (counties) gradually increased the reimbursement to 80 per cent of 600 francs for a

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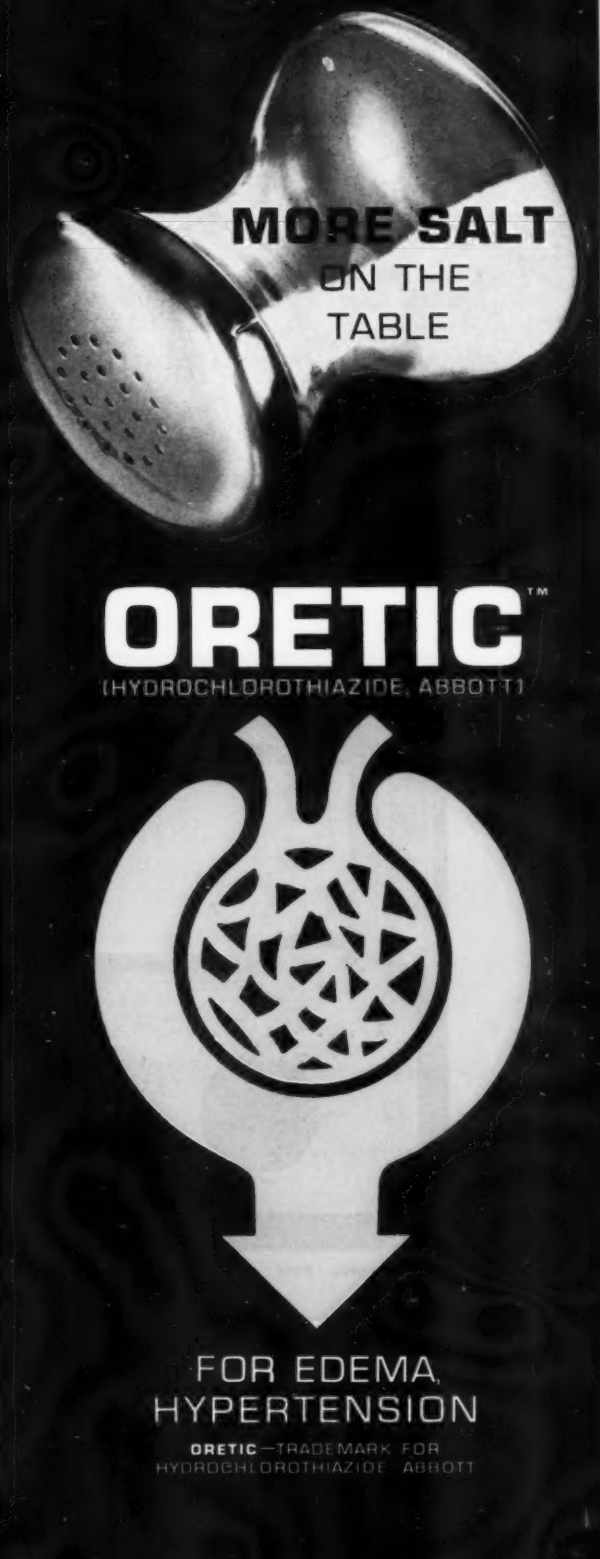

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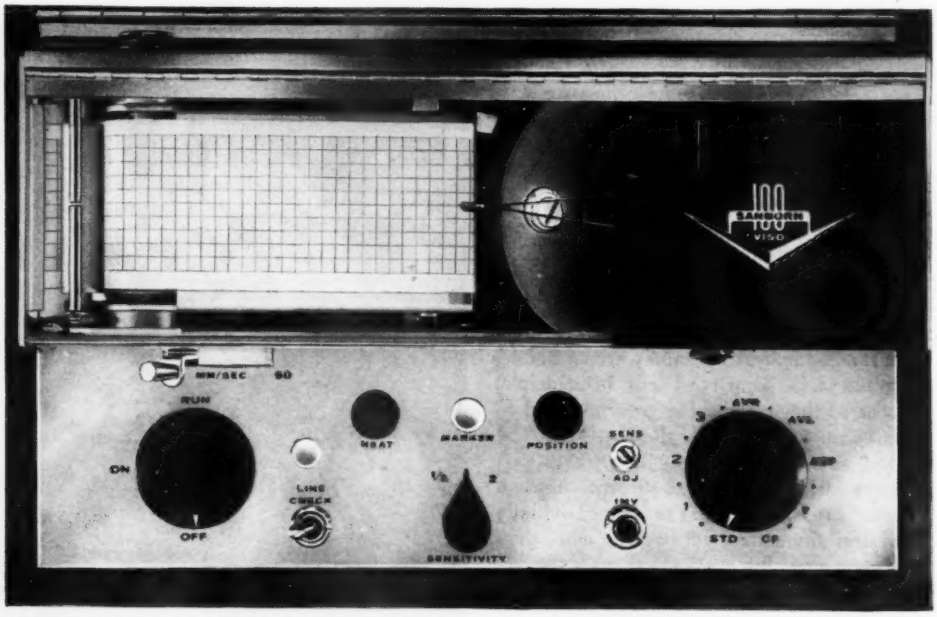

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visit, but the physician cannot ask for more unless exceptional circumstances prevail. The fee for a home visit is 800 francs (about $1.50). Medical treatments have a supplementary table of fees: for example, a sclerosing injection for varicose veins is 1,080 francs (about $2.00). In exceptional circumstances, such as when the physician has a scientific title, fees may be raised without increasing the reimbursement.

The reimbursements for radiologic and electrotherapeutic treatments were recently lowered on the grounds that some abuse was detected. A treatment with ultraviolet rays costs 240 francs (50 cents), which is only a little more than the salary of the nurse supervising the treatment. These new and unforeseen conditions are causing deep concern.

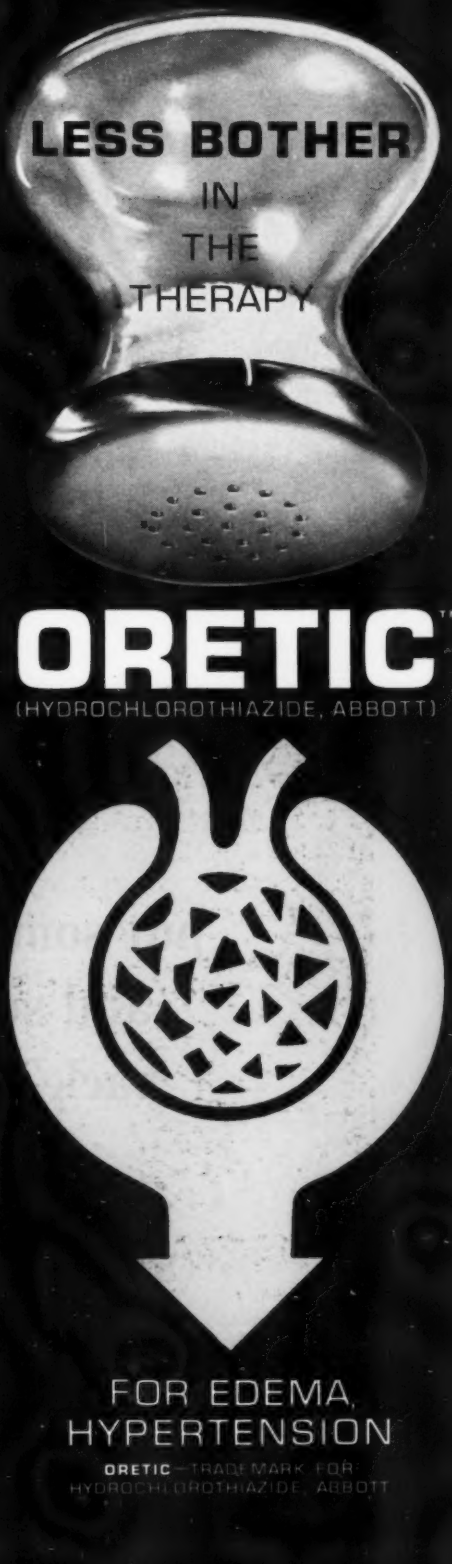
Payments for laboratory work and drugs formerly were reimbursed to 80 per cent of the bill charged by the laboratory or pharmacist. In the future, the first 3000 francs in each quarter of the year will be excluded from reimbursement. This will be a hardship for the poorer patients. It will be necessary to establish categories of families to whom reimbursement will be made, and the expenses of bookkeeping will consume much of the savings realized by this measure.

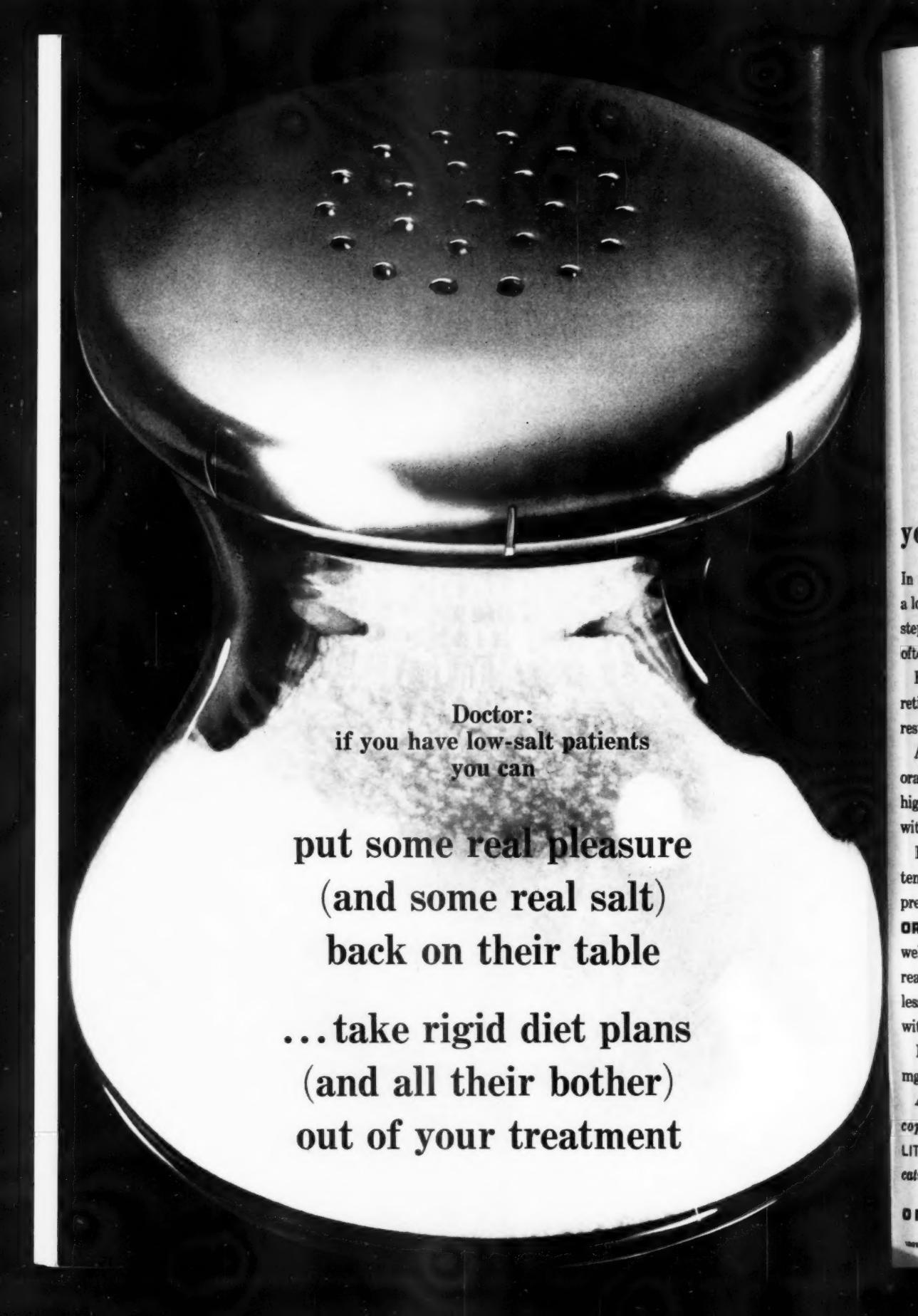
Despite the faults and difficulties in the proposed plan, the changes as a whole are healthy and inevitable and are evoking more approval than criticism. The government has promised to consider existing conditions and to introduce the plan progressively over several years. It is possible that after a year or two of polishing this system a satisfactory solution for the majority of patients and physicians will be found, and the criticisms will cease. At present, the government, tired of the discussions with the groups and syndicates, is promulgating decrees which have the force of law. As soon as fallacies in the plan become evident, they will be corrected to satisfy the greatest number of people.

GREECE

Refresher courses—Every summer for the last 10 years, intensive refresher courses have been organized by Professor N. Tsampoulas, head of the Clinic of Internal Medicine, University of Athens Medical School. This year, the teachers were Professors N. Christeas, E. Fokas, T. Garofallides and A. Gouttas. Fields in which

(Continued on page A-116)

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you can
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(and some real salt)
back on their table
...take rigid diet plans
(and all their bother)
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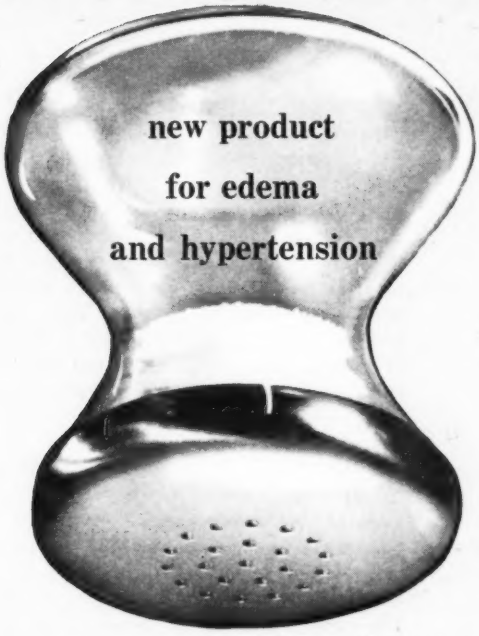

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instruction was offered included surgery, internal medicine, cardiology, obstetrics, pathology, orthopedics, etc.

The medical schools of the universities of Athens and Salonica, in cooperation with the Greek Medical Association and some of the local medical associations, offer many postgraduate studies and refresher courses. The government and the ministry of public health are expected to help doctors, especially those practicing in rural areas, to attend these courses, since the average income of physicians in Greece is extremely low.

Congress of the Medico-Surgical Society of Athens—Sessions of the 15th annual congress of the Medico-Surgical Society of Athens were held in Agrinion and Mesolóngion. The meeting was devoted to a discussion of diabetes mellitus, in which some 40 speakers participated. The many aspects of the disease which were covered included the following: pathogenesis, history, diagnosis, symptoms, clinical forms and complications of diabetes; its relation to pregnancy, allergy, coronary heart disease, ocular disorders, skin lesions, tuberculosis, the liver, lithiasis and obesity; hypoglycemic and orally administered antidiabetic preparations; diabetes in children; diabetes as a socio-economic and public health problem; surgery and diabetes; diabetic coma; and saccharuria and head injuries.

It is customary to hold these meetings in different towns. The next congress will be in Cyprus.

Health insurance—Recently, the Greek government decided to grant full coverage for health insurance to governmental employees and their families. The Greek Medical Association has protested this decision, because many Greek physicians believe that the National Social Insurance Institution does not give doctors an adequate income and that health insurance for an additional 350,000 people will cause the situation to become worse. The Association has requested that patients be allowed to choose their own doctor and that the various independent insurance funds be unified into one organization under the auspices and control of the Public Health Ministry. It is thought that such steps would lower the administrative expenses and handicaps of the present plan. Thus far, however, these requests have not been granted. Some hold the opinion that private interests are against changes in the existing organization. Many Greek doctors believe that their demands will not be met until the medical profession in Greece becomes better organized.

MEETINGS *and Postgraduate Courses*

AMERICAN ACADEMY OF PEDIATRICS, CHICAGO: Twenty-eighth annual meeting, October 3-8, at the Palmer House. For further information, write to: Executive Office, American Academy of Pediatrics, 1801 Hinman Avenue, Evanston, Ill.

AMERICAN INSTITUTE OF ULTRASONICS IN MEDICINE, MINNEAPOLIS: Annual meeting, September 2, at the Leamington Hotel. For further information, write to: Dr. John H. Aldes, Secretary, 4833 Fountain Avenue, Los Angeles.

INTER-SOCIETY CYTOLOGY COUNCIL, DETROIT: Annual scientific meeting to be held at the Statler Hilton Hotel, November 19-21. For further information, write to: Dr. Paul A. Younge, Secretary, 1101 Beacon Street, Brookline 46, Mass.

NEW YORK STATE DISTRICT BRANCHES OF THE AMERICAN PSYCHIATRIC ASSOCIATION, NEW YORK: Divisional meeting, November 27-29, at the Biltmore Hotel. Science writers are invited. For further information, write to: Dr. James P. Cattell, 880 Fifth Avenue, New York 16.

SECOND INTERNATIONAL MEETING OF FORENSIC PATHOLOGY, NEW YORK: To be held September 18-21, 1960. Meeting will include dedication of the new building for the Office of the Chief Medical Examiner, City of New York. For further information, write to: Dr. Milton Helpern, 55 East End Avenue, New York 28; Dr. Charles Larsen, Tacoma General Hospital, Tacoma 5; or Dr. Francis E. Camps, 37 Welbeck Street, London W.1, England.

TUFTS UNIVERSITY SCHOOL OF MEDICINE, BOSTON: Postgraduate courses for 1959-1960:

Review of recent advances in internal medicine, October 5-10
Electrocardiography I, December 7-11
Pediatrics, March 17-19
Hematology, April 7-9
Electrocardiography II, April 11-13
Neurology, April 27-30

For further information, write to: Dr. Robert P. McCombs, Director, Postgraduate Division, Tufts University School of Medicine, 171 Harrison Avenue, Boston 11.

UNIVERSITY OF CALIFORNIA SCHOOL OF MEDICINE, BERKELEY-SAN FRANCISCO: Postgraduate courses for 1959:

A selective review of internal medicine, September 12-16
Symposia in obstetrics and gynecology, September 17-19

For further information, write to: Dr. Seymour M. Farber, Head, Continuing Medical Education, University of California Medical Center, San Francisco 22.

Hematologic disorders can seriously threaten the welfare of newborn infants. A comparatively small loss of blood may be a life-endangering hemorrhage in a small infant. The susceptibility of the newborn's central nervous system to damage by bilirubin adds a most serious threat to a hemolytic crisis. Disorders of the blood in the newborn often are difficult to diagnose, and prompt emergency treatment must be administered if permanent residual damage is to be avoided.

Hematologic Disorders in the Newborn

C. W. REIQUAM* AND NATHAN J. SMITH†

University of Wisconsin Medical School, Madison

THE experienced physician is well aware that a variety of disorders of the blood may be encountered in the newborn period. Hemolytic disease of the newborn with blood group incompatibility is by far the most frequent primary hematologic condition which first may be manifested in the newborn nursery; however, other anemias, such as those dependent on blood loss or on the newborn's failure to produce erythrocytes, may be encountered. Disorders of leukocytes and thrombocytes and many defects in hemostasis also may be recognized in the newborn.

Defining the limits of normal in both the clinical and laboratory examinations is difficult in the newborn period. The proper evaluation of pallor, icterus, a palpable spleen or minor evidences of bleeding may be extremely difficult and frequently is possible only if it is done in conjunction with appropriate laboratory findings. Conversely, proper interpretation of laboratory results can be done profitably only when a careful clinical study of the infant is also at hand. The list of normal blood values given in table 1 can be most useful if ample latitude in interpretation is allowed in keeping with technics used in a given laboratory and with the clinical status of the infant.

C. W. REIQUAM

NATHAN J. SMITH

Disorders of Erythrocytes in the Newborn Period

Anemia in the first days of life, as at any age, may be due to the inability of the organism to produce erythrocytes normally or to the excessive loss of erythrocytes from the circulation by hemorrhage or hemolysis. In evaluating the anemic infant, it is of primary importance to determine which of these basic

*John Orton Watkins Instructor in Pediatrics; †Alfred Dorance Daniels Professor of Pediatrics and Chairman of the Department of Pediatrics, University of Wisconsin Medical School, Madison, Wisconsin.

TABLE 1

BLOOD VALUES IN THE NEWBORN*†

MEASURED COMPONENTS	BIRTH		FIRST DAY	FOURTH DAY	SEVENTH DAY	FOURTEENTH DAY
	Cord blood	*Capillary blood*				
Red blood cell count (millions per mm.^{3})	3.6-5.5	3.8-6.0	4.5-6.5	4.5-6.3	4.4-6.0	5.0
Hemoglobin (gm. per 100 ml.)	13.5-19	14.5-21	16.5-23	16.5-22.5	16.5-21.5	17.5
Hematocrit (per cent packed rbc)	56.6		56.1		52.7	
Reticulocytes (per cent rbc)	1.5-5.5	3.7	4.5	4.0	0.8	0.5
MCV (μ^3)			106		103	
MCH ($\mu\mu$g.)			35.5		35.5	
MCHC (per cent)			33.5		34.5	
White blood cell count (per mm.^{3})	12,000	14,000	20,000	8500	10,000	11,000
Neutrophils (per cent)	42	47	62	33	27	38
Lymphocytes (per cent)	38	36	25	41	50	50
Monocytes (per cent)	17	14	10	23	20	9
Eosinophils (per mm.^{3})	100-450		100-700	75-400	75-475	
Basophils (per mm.^{3})	30-50		50	20	25	
Platelets (1000 per mm.^{3})‡	170-400					170-400

MCV = mean corpuscular volume; MCH = mean corpuscular hemoglobin; MCHC = mean corpuscular hemoglobin concentration.

*The variations in differential counts are marked during the first days of life. The wide range indicated for some of the values may indicate actual variations plus differences in technic.

†Values adapted from K. Betke: Hämatologie der ersten lebenszeit. Ergebnisse der inneren Medizin und Kinderheilkunde. Berlin, Göttingen and Heidelberg, Springer-Verlag, 1958, vol. 9.

‡Guest, G. M., Brown, E. and Lahey, M. E.: Normal blood values in infancy and childhood. Pediat. Clin. N. America, p. 368 (May) 1957.

abnormalities is present. Clinical evidences of hemorrhage may or may not be present. Unusual hepatosplenomegaly, icterus and excretion of highly pigmented urine and stool are to be expected if hemolysis is excessive. With the exception of the hepatosplenomegaly, however, these latter signs are rarely present at birth. Careful morphologic study of the blood film, reticulocyte counts, and serum bilirubin determinations are laboratory aids commonly employed to support the clinical impression of the basic cause of anemia in any newborn.

Anemia Associated With Blood Loss

From their studies, Mollison, Neall and Cutbush[1] calculated the newborn infant's total blood volume to be 84.7 ml. per kilogram. Thus, for a healthy newborn infant weighing 3.2 kg. (7 lb.) the total blood volume would be 271 ml. or a little more than ½ pt. This small amount leaves a narrow margin of safety when one visualizes that on losing 4 oz. of blood an infant has only 4 to 5 oz. remaining in his body.

Anemia will be readily recognized as a problem if there is obvious blood loss at delivery or if the infant has marked pallor. There often may be some question as to whether or not these infants with marked pallor are in frank shock at the time of birth. If the pallor is accompanied by shallow, rapid respirations and a rapid pulse rate, prompt treatment may be lifesaving. When blood loss is considerable, these pale babies are in a shocklike state, which is important to recognize. In addition to their pallor, they are remarkably quiet or relatively inactive; otherwise, they often do not appear to be ill. If the resulting hypoxia is not promptly corrected, it can cause permanent damage to the central nervous system.

Maternal vaginal bleeding during the pregnancy or during labor cannot always be assumed to be from the mother. This is true of either acute hemorrhage or persistent spotting. The sudden gushing of bright red blood from the mother's vagina may well be a massive hemorrhage from the infant. Separation of the placenta, as in abruptio placentae or placenta

praevia and in faulty development of placental or umbilical vessels, or tearing of fetal membranes may account for obvious hemorrhage. Whether the external bleeding is of maternal or fetal origin may be determined readily by the Apt test[2] (figure 1). This simple procedure, based on the alkali resistance of the normal content of fetal hemoglobin in the infant's blood, should be available in any delivery area and newborn nursery. The test is performed as follows:

1. Mix 2 to 3 ml. water with an equal amount of bloody material to obtain a distinct pink-red supernatant hemoglobin solution.
2. Centrifuge at 2000 rpm for two minutes. Decant the supernatant solution.
3. To five parts supernatant fluid, add one part 0.25 N (1 per cent) sodium hydroxide.
4. Within one to two minutes a color reaction appears. A yellow-brown color (alkaline heme) indicates that the blood is maternal; a red color indicates fetal hemoglobin which has resisted conversion to alkaline heme.

A pale baby and obvious hemorrhage are readily related; in the absence of an obvious prenatal hemorrhage, a pale baby may be puzzling. This situation may result from the obstetrician's failure to recognize or appreciate the importance of a small fetal hemorrhage occurring during delivery. In addition, good evidence exists that fetomaternal transfusion, i.e., a leak of fetal blood into the maternal circulation,[3] can account for obscure "invisible" bleeding. There is evidence that occult fetal blood loss may occur in three different ways: (1) The hemorrhage may be directly into the placenta without entering the mother's circulation. Early examination and perhaps even weighing the placenta after delivery may give the physician the clue he is searching for to account for the pallor of the baby. (2) During labor and, perhaps, for weeks before delivery the blood may pass directly from the infant into the mother's circulation. (3) The bleeding may occur into the placenta and then pass into the mother's circulation just at the time of delivery. Such bleeding conceivably may initiate a transfusion reaction in the mother if she and the infant are of heterologous blood types.[4]

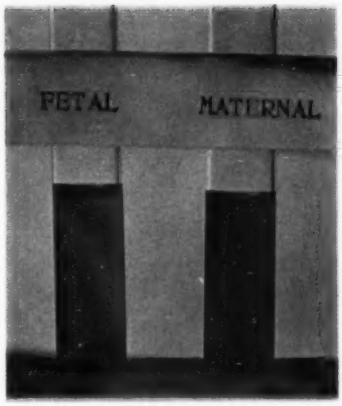

FIGURE 1. The Apt test. The tube on the left contains alkali-resistant fetal hemoglobin. The tube on the right contains alkali-denatured maternal (adult) hemoglobin.

In twin pregnancies an unusual vascular abnormality may occur in which anomalous placental development allows a cross circulation. At delivery one twin's blood may serve as a transfusion for the other, leaving one baby plethoric and the other anemic.

Bleeding directly into the mother's circulation may be detected by the alkali-denaturation method for determining fetal hemoglobin in the mother's blood.[5] Fetal hemoglobin in the mother's blood may occur normally as 2 per cent or less of the total circulating hemoglobin. Another test which may be used in pregnancies in which the infant and mother are not of the same blood group is the differential agglutination method of Ashby, by which the infant's red blood cells in the mother's blood may be detected and estimated.

Exsanguination can occur in a matter of a few minutes in the newborn. The infant dies not from the loss of erythrocytes but from loss of his circulatory volume. If the amount of bleeding is great, intravenous fluid must be given immediately to reconstitute the infant's circulating blood volume. Inevitably, some time will elapse before compatible blood is available for transfusion. Group O Rh-negative blood serves well for emergency transfusion, and its use without crossmatching may avoid a fatal delay. At least 20 ml. of blood per kilogram of body weight will be necessary. If

this is not available in such an emergency, 0.45 per cent saline in 2.5 per cent dextrose may be given, followed by the administration of salt-poor albumin. A suggested amount of 15 ml. per kilogram of body weight of the saline-dextrose solution may be given over a five minute period, followed by 10 ml. albumin per kilogram of body weight given over a 10 minute period. With prompt recognition of the problem and with a sense of urgency in the treatment, both the mortality and the incidence of residual brain damage in infants who have neonatal blood loss should be reduced to a minimum.

If there is gross evidence of bleeding and yet the infant's clinical condition or the hemoglobin concentration does not reflect significant blood loss, determination of the hemoglobin immediately post partum, again in 30 minutes, and at two hours may reveal a measurable fall in concentration. There is some evidence that after massive hemorrhage in the newborn the intravascular readjustment to maintain fluid volume is rapid.[6] Thus, repeated hemoglobin levels may reflect fairly accurately the degree of blood loss even in severe acute bleeding.

It is of interest to point out here that following significant blood loss in the newborn period iron deficiency anemia may appear in an infant as young as four to five months of age. Supplemental medicinal iron should be given to infants who have had neonatal blood loss.

Anemias Associated With Hemolysis

Hemolysis with extracorpuscular abnormalities—Iso-immune hemolytic disease—Hemolytic disease of the newborn characterized by blood group incompatibility is by far the most common cause of excessive hemolysis of the erythrocytes. It is the prime example of a hemolytic disease in which an acquired abnormality in the environment of the erythrocyte manifests itself in hemolysis. There are several blood group factors which can cause this difficulty through fetomaternal incompatibility. Any antigen which is contained in the fetal red cells but is absent in the mother's cells is a potential cause of formation of antibodies in the mother's blood. Since the mother lacks the antigen in her red cells, the antibody causes no problems for her (unless she is transfused with cells containing the antigen). But when the antibody is returned from the mother to the baby through the placenta, the baby has both antigen and antibody, and erythroblastosis results. Incompatibility in the ABO and Rh systems is responsible for over 95 per cent of such cases.

One of the consequences of hemolysis from any cause is hyperbilirubinemia. The permeability of the blood-brain barrier allows free bilirubin to pass through, and the noxious effect of this material on the susceptible central nervous system results in kernicterus. The success of lowering the elevated serum bilirubin level and preventing kernicterus by exchange transfusion is well documented. The proper use of exchange transfusions can essentially eliminate the occurrence of kernicterus and prevent deaths from rapidly advancing anemia; however, in spite of this enormous advance in management, there are still important unsolved problems of hemolytic disease of the newborn.

Some of the infants who are born severely anemic and who die within the first 24 hours of life can be saved by prompt treatment; however, to date, no satisfactory answer is available for those infants who are stillborn or who have severe fetal hydrops. It should be stressed that families into which such infants have been born should not despair. With proper obstetric and pediatric care, in most instances they may still have viable infants who will live and develop normally.

At the present time exchange transfusion is the best treatment for infants who have hemolytic disease of the newborn related to blood group incompatibility. If the transfusion is to be available on time, *anticipation* of an affected infant is essential. This can be done only by appropriate management of all pregnancies, including anti-Rh antibody titer near the thirty-fifth gestational week on all pregnant Rh-negative women. Group O Rh-negative blood which is compatible with mother's blood and less than 72 hours old should be made available during the labor of every Rh-negative mother who has anti-Rh antibodies in her serum.

Mention should be made here that an ex-

change transfusion, repeated if necessary, is effective treatment for reducing the hyperbilirubinemia in a newborn despite the cause of his jaundice. It is the free (indirect) bilirubin which is implicated in the irreversible damage of the brain in infants, and it is important that exchange transfusion be done in all infants with hyperbilirubinemia approaching 20 mg. per milliliter even though the infant is approaching one week of age. In the premature infant the bilirubin level should not be allowed to rise to levels usually considered safe in a mature newborn. The exchange transfusion is not a procedure to be done without proper training and respect for the complications that can arise during its course.

Hemolytic anemias associated with infection—Infection-induced anemia in the newborn may or may not have an important hemolytic component. The form which is not primarily hemolytic ranks second to iso-immunization as a cause of jaundice in the newborn, if we exclude "physiologic" jaundice. Septic involvement of the liver, which in a sense paralyzes the liver's ability to remove the bilirubin brought to it, likely accounts for part of the jaundice. This, combined with a hemolytic component, can produce a marked hyperbilirubinemia. Until the present time severe jaundice resulting from sepsis has been seen chiefly in those infants infected with *Escherichia coli* organisms. With the emergence of more organisms resistant to antimicrobial therapy, especially the *Staphylococcus*, anemia and jaundice in the newborn period may assume even greater importance. Sepsis must be an early consideration in any neonate who becomes anemic or unusually jaundiced during the first few days of life. It is important to remember that the signs of infection expected in older subjects are not to be expected in these very young infants.

Hemolytic anemias associated with chemical agents—Chemically induced hemolysis has been considered an extrinsic or extracorpuscular type of hemolysis. It is now known that an increased susceptibility, genetically determined, of the red blood cells of certain persons predisposes these cells to hemolysis in the presence of varying amounts of certain chemicals. The mechanism of hemolysis is not fully elucidated and may not be identical in all cases, but probably it is similar to that in favism in which there is a reduction of activity of the enzyme glucose 6-phosphate dehydrogenase.[7] This enzyme is necessary in catalyzing a reaction which provides reduced triphosphopyridine nucleotide (TPN), which in turn is the hydrogen donor for maintaining glutathione in a reduced state. There is a marked decrease in reduced glutathione in the defective erythrocytes of susceptible persons. This defect in the red blood cells has been detected in certain laboratories by a method known as the glutathione stability test.[8] In vitro effects of primaquine,[9] naphthalene and its derivatives, nitrofurantoin, phenylhydrazine, sulfanilamide or large doses of vitamin K on these intrinsically defective erythrocytes indicate that hemolytic anemia is caused by these agents when glutathione is not maintained in the reduced state. Perhaps there are other intrinsic defects in red blood cells that respond to an altered extrinsic environment by producing hemolysis of the erythrocyte.

Commercial products directed to the newborn to make him smell sweeter, his clothes "purer," or his skin softer may do these things, but an infant with susceptible red blood cells may have an acute hemolytic anemia and an unusual hyperbilirubinemia as a consequence of his chemically induced social acceptability. Hemolytic anemia following naphthalene exposure has been induced in several interesting ways. Usually there is a history of moth ball ingestion; or, as recorded by Zinkham and Childs,[10] the craving for and intermittent ingestion of moth balls by a pregnant mother, which was followed by a hemolytic process in her newborn infant. The use of diapers stored in moth balls was incriminated as a source of naphthalene poisoning in a neonate with hemolytic anemia.[11] Blood transfusions and removal of the offending agent readily remedied the situation in this case.

Hemolysis with intracorpuscular defects—Hereditary spherocytosis—Hereditary spherocytosis can cause symptoms of a severe hemolytic crisis during the first week of life and certainly may be confused with other hemo-

lytic anemias in this period. Microspherocytic erythrocytes are characteristic, and findings in the osmotic fragility test will be abnormal. The copper-colored, thick spherocytes will be seen on peripheral smears of patients with ABO hemolytic disease as well as of those with hereditary spherocytosis. Careful searching may reveal a family history or laboratory evidence of hereditary spherocytosis in the mother or father. This finding in addition to blood group studies will differentiate hereditary spherocytosis from ABO hemolytic disease.

The precise mechanism of hemolysis of the microspherocytes is not known, but certain abnormalities in the carbohydrate metabolism of these cells have been demonstrated.[12] The spleen is the site of destruction of the erythrocytes. It has been shown that the spleen acts as a trap through which the spherically shaped red cells cannot pass normally.[13]

Splenectomy permanently and completely relieves the symptoms. The microspherocytosis remains, but the splenic trap of spherocytes is removed. Failure of splenectomy to result in a symptomatic "cure" almost always can be attributed to an error in diagnosis.

The spleen is implicated in the immune mechanisms of the body. Removal of the spleen in the newborn period should be undertaken cautiously, as it has been documented that splenectomized infants may have an increased susceptibility to serious and often fatal infections in early life. This incidence of serious infection in splenectomized patients and in congenital absence of the spleen[14] should temper one's decision to remove the spleen from young patients who have asymptomatic, well-compensated hemolytic disease.[15] The apparent increased susceptibility to infection is only a relative contraindication, and, if the infant is in constant jeopardy because of recurrent hemolysis with anemia, a splenectomy will assure him relief from these symptoms.

Elliptocytosis—Symptoms from elliptocytosis are unusual, but cases in which hemolytic anemia has produced jaundice in the newborn have been documented.[16] This genetically controlled red blood cell anomaly has long been recognized but chiefly as a curiosity and not as an entity capable of producing anemia and jaundice in the newborn. The diagnosis is made by identifying elliptocytes in the peripheral smear of the infant and in smears from members of his family. Those patients in whom compensation for hemolysis is incomplete will benefit by splenectomy.

Hereditary nonspherocytic hemolytic anemia—Hereditary nonspherocytic hemolytic disease is rare, and it may be easily mistaken for erythroblastosis during the newborn period. The disease is probably caused by a genetically controlled intrinsic red blood cell defect. Diagnosis is difficult and perhaps is best done by eliminating the other possibilities. No Rh incompatibility will be found, the Coombs test will give negative results, and there will be no family history of spherocytosis. Some observers feel that normal rouleaux formation in fresh blood specimens is characteristic, contrasting to the deformed rouleaux in hereditary spherocytosis. Splenectomy is of no value in these patients, but exchange transfusion occasionally may be indicated to reduce the hyperbilirubinemia in the newborn period.

Other intracorpuscular defects—Several other intracorpuscular defects of the red blood cells will only be mentioned, since their symptoms do not appear until after the infant is two to three months of age or older. Examples of these conditions are sickle cell anemia, Mediterranean anemia, and the abnormal hemoglobinopathies with hemoglobin C, D, E, G and H, etc. The explanation for onset of these diseases later in infancy is related to the presence of a high concentration (60 to 95 per cent) of fetal hemoglobin in the erythrocytes at birth. It has been shown that after 34 weeks' gestation the percentage of fetal hemoglobin drops 3 to 4 per cent each week.[17] Thus, several weeks would elapse before fetal hemoglobin would be replaced to the extent that there would be a sufficient concentration of abnormal hemoglobin within the erythrocytes to predispose the patient to a hemolytic disease syndrome.

Anemias Associated With Decreased Production of Erythrocytes

Inadequate production of erythrocytes in the newborn usually results from some spe-

cific damage to erythrocyte precursors in the bone marrow rather than from nutritional deficiencies which commonly impair erythrocyte and hemoglobin production in older infants and children. Although it is an uncommon cause of bone marrow damage in older children, widespread infection acquired in utero or during the birth process is the most common cause of impaired erythrocyte production in the newborn.

The infection may be bacterial in nature, most commonly *Esch. coli* or *Micrococcus pyogenes*. Congenital syphilis and viral infections, e.g., cytomegalic inclusion disease, may damage the bone marrow in utero and result in some degree of anemia at birth. Some degree of granulocytopenia and thrombocytopenia is to be expected in such situations, since megakaryocytes and granulocyte precursors in the marrow are damaged by these infections. As was previously mentioned, some infectious agents are capable of causing hemolysis. Anemia in the presence of many neonatal infections will be due to both hemolysis and impaired production of erythrocytes.

Congenital absence from the bone marrow of erythrocyte precursors may be encountered rarely and manifested as anemia in very early life. Erythroid precursors alone may be absent in congenital hypoplastic anemia (erythrogenesis imperfecta), with a refractory anemia as the only hematologic abnormality expected. Granulocyte and platelet precursors as well as erythrocyte precursors are affected in congenital aplastic anemia (Fanconi's anemia), with granulocytopenia, thrombocytopenia and anemia evident in these rare instances. The last-mentioned condition is usually associated with multiple congenital anomalies; particularly frequent are skeletal anomalies in the hands and lower arms.

Anemia due to decreased erythrocyte production is rarely severe at birth. Transfusions will be needed infrequently during the first few days of life. The course of the anemia will depend on the causative factor. The anemias due to infection will respond if the infection can be effectively treated. The congenital hypoplastic and aplastic anemias may be favorably influenced by adrenocorticosteroid therapy. Many patients fail to respond, however, and must be maintained in later childhood by repeated transfusions.

Disorders of the Leukocytes in the Newborn Period

The normal leukocyte count and differential distribution have been mentioned previously (table 1). A relatively wide range of "normals" characterizes these values during the first days of life. In addition, a rather striking ability of the infant to mobilize large numbers of leukocytes into the circulation is characteristic of this age. A variety of noxious stimuli, such as septicemia or more localized infections, hypoxia, hemorrhage or unusual trauma, all can be responsible for the rapid appearance of a striking neutrophilic leukocytosis. Otherwise-unexplained leukocytosis will be encountered on rare occasions in congenital leukemia in the newborn period. This rare condition is found with unusually high frequency in mongoloid infants. It is subacute myelogenous in type, and in most instances leukocytic changes are accompanied by thrombocytopenia, anemia, hepatosplenomegaly and other evidences of leukemia.

Neutropenia, a less than normal number of circulating neutrophils, may be encountered in the newborn period. Its occurrence most often follows impaired ability to produce neutrophilic granulocytes, rather than resulting from their excessively rapid removal from the circulation. Sepsis, usually with a gram-negative bacillus infection, is the most common cause of suppression of neutrophilic granulocyte production in the first few days of life. Unusual icterus, gastrointestinal tract symptoms and failure to gain, associated with neutropenia, are to be expected in the infant with severe sepsis. When the infection is sufficiently severe to cause neutropenia the prognosis should be guarded. Widespread intra-uterine infections, such as toxoplasmosis, cytomegalic inclusion disease and syphilis, also can be responsible for extensive bone marrow damage and resulting neutropenia. Some degree of anemia and thrombocytopenia usually accompanies the granulocytic deficit in these conditions.

Transient neutropenia in the newborn peri-

od, resulting from iso-immunization of the mother and transplacental passage of antileukocyte antibodies, has been described by Luhby and Slobody.[18] Neutropenia in these patients was evident for three to four weeks after birth and was spontaneously corrected as the maternal antileukocyte antibodies disappeared from the infant's circulation. The frequency of such an occurrence is unknown, but this possibility should be a consideration in any instance of otherwise-unexplained neutropenia in the newborn.

A new form of neutropenia in infancy, starting in the newborn period, has been studied first by Kostmann[19] in Sweden. It has recently been encountered in this country. The affected infants are unable to produce neutrophilic leukocytes, although early precursors of these cells are present in the bone marrow. The disease is genetically controlled and is transmitted in a simple recessive pattern. Infants with this disease, which is called infantile genetic agranulocytosis, usually die in early life of overwhelming bacterial infection.

Other rare, genetically controlled abnormalities affecting granulocytes have been studied and may be encountered in the newborn period, usually occurring as incidental asymptomatic findings noted first in routine blood studies. Pelger's nuclear anomaly and Chediak-Higashi disease are examples of these unusual states.

Bleeding in the Newborn Period

Hemorrhage in the newborn is important not only as a cause of anemia and a frequent threat to survival but also because it may be the first manifestation of a serious primary hemostatic defect which may continue to impair the health of the infant. Immediate as well as future management of the bleeding problem depends on precise diagnosis, which usually can be achieved in the newborn period with appropriate laboratory aids.

With increased understanding of the mechanisms of hemostasis, it is becoming increasingly apparent that the designation "hemorrhagic disease of the newborn" has lost any specific meaning and clinical significance and could best be discarded. The *normal* decline in prothrombin activity in the first few days of life has not been found consistently responsible for any bleeding disorder encountered at that time. When bleeding is encountered in the immediate neonatal period, a cause other than the *normal* low level of prothrombin activity must be sought.

Administration of vitamin K will increase the prothrombin activity in the first days of life. With recognition of the insignificant role the normally reduced prothrombin activity probably plays in the cause of bleeding in the newborn, the therapeutic usefulness of vitamin K in this age group is minimal indeed. The potential toxicity of such naphthoquinone components in causing hemolysis, hyperbilirubinemia and brain damage has been mentioned previously. If for any reason vitamin K is to be used, doses should not exceed 1.0 mg. daily.

Bleeding may be a manifestation of basic abnormalities in coagulation, such as in the hemophilias, or of abnormalities in small vessel hemostasis dependent on normal platelet function and small vessel integrity. In the newborn infant clinical manifestations of bleeding cannot be relied on to differentiate defects in these two general hemostatic mechanisms, and laboratory assistance will be needed. It should be recognized that because of the infant's small blood volume serious bleeding may occur on occasion and may not be directly visible. The infant may have bled profusely into either a soft-tissue space or one of the body cavities such as the thorax or the ventricular system of the brain.

Certain forms of neonatal bleeding, accompanied by no other manifestations of generalized bleeding tendency, are usually not significant in an evaluation of the competence of hemostasis. These include cephalhematomas, retinal or conjunctival hemorrhages, and the presence of a few scattered petechiae about the forehead. The bloody vaginal discharge found occasionally in an infant near the fifth to seventh day is endometrial in origin and results from the infant's removal from maternal hormonal influences at the time of birth.

Bleeding as a manifestation of disorders of blood coagulation—A defect in the coagulation system resulting in neonatal hemorrhage

is rare; when it does occur, the extent of blood loss often is great. Usually, the bleeding is from the umbilicus or from a circumcision wound. On occasion the infant bleeds from a number of sites without apparent provocation. Blood passed from the gastrointestinal tract often may be the first sign of a coagulation defect. However, vomited blood or blood in the stool may be maternal blood swallowed during delivery or from the ingestion of blood by the nursing baby from the mother's cracked nipples. This ingested blood mixed with meconium and the newborn infant's stools may be noticed because of an abnormal odor or color of the meconium. It is important to use the Apt test (figure 1) to establish the origin of the hemoglobin as fetal or maternal.

Most of the known coagulation factors have been identified through the study of patients who have had inborn metabolic errors preventing the normal synthesis of some protein essential for normal coagulation. The inability of the patient with classic hemophilia to synthesize antihemophilic globulin in normal amounts is the best-known example of such an abnormality. A male infant unable to synthesize antihemophilic globulin and destined to be a severe hemophiliac rarely bleeds from the umbilical cord and may tolerate circumcision well at 12 to 36 hours of age, yet he may bleed profusely after two to three days.

The reasons for this delayed onset of symptoms are not clear. The bleeding cannot be readily related to a drop in the effective concentration of maternal antihemophilic globulin transferred before birth to the infant's plasma. Didisheim and Lewis[20] mentioned three cases in which a newborn infant's cord blood was devoid of AHG; at least the AHG was not present in measurable levels. One infant was observed for several months and had no symptoms of a hemostatic defect until easy bruising was noted at three months of age.

There is evidence that the hemostatic mechanism for a normal newborn infant is deficient in many respects as compared with that of an older infant or a normal adult, yet the proper balance between the various coagulation factors probably assures the infant of hemostatic integrity. The expected "deficiencies" do not negate the usefulness of various tests to determine the deficiencies that are severe enough to cause symptoms.

TABLE 2

THROMBOPLASTIN GENERATION

FACTOR	ABBREVIATIONS AND SYNONYMS
Antihemophilic globulin	AHG, factor VIII, thromboplastinogen, plasma thromboplastic factor A, prothrombokinase, thromboplastic plasma component
Plasma thromboplastin component	PTC, factor IX, Christmas factor, antihemophilic globulin B, plasma thromboplastin factor B
Plasma thromboplastin antecedent	PTA, plasma thromboplastic factor C
Platelet factor	Thromboplastinogenase, platelet activator; necessary for the initiation of the process which forms thromboplastin; other factors also may be involved

TABLE 3

PROTHROMBIN CONVERSION*

FACTOR	ABBREVIATIONS AND SYNONYMS
Prothrombin	
Labile factor	Cofactor of thromboplastin, factor V of Owren, plasma Ac globulin, plasma prothrombin conversion factor, proaccelerin
Stable factor	Cothromboplastin, factor VII, serum prothrombin conversion accelerator (SPCA), proconvertin ⟶ convertin

*Calcium is essential for the conversion of prothrombin to thrombin and is necessary for the action of the stable factor. Thrombin acts in converting fibrinogen to fibrin, which is the framework of the clot.

Defects in the generation of thromboplastin and in the conversion of prothrombin to thrombin account for most recognized abnormalities in the coagulation process in newborns. Tables 2 and 3 list the principal factors involved in the coagulation mechanism, excluding platelets and calcium; table 4 indicates a simplified scheme of the place of these factors

TABLE 4

SCHEME OF NORMAL COAGULATION

Stage 1.	Thromboplastin generation Platelets + plasma thromboplastin precursors (AHG, PTC, PTA) ⟶ thromboplastin
Stage 2.	Prothrombin conversion to thrombin Thromboplastin + stable factor + labile factor + prothrombin + calcium ⟶ thrombin
Stage 3.	Thrombin + fibrinogen ⟶ fibrin

AHG = antihemophilic globulin; PTC = phenylthiocarbamide, plasma thromboplastin component; PTA = plasma thromboplastin antecedent.

in the clotting mechanism. Laboratory methods are available for the specific diagnosis of these defects. If their limitations are recognized, clinically useful procedures are the Quick prothrombin time, the thromboplastin generation, the prothrombin consumption tests, and determinations for individual factors such as stable factor, labile factor and fibrinogen. These tests are helpful to determine first which of the phases of coagulation is abnormal and, second, which specific factor is deficient. The use of plasma treated with barium sulfate, stored plasma, or plasma from patients with a known coagulation defect is helpful in precisely identifying a deficiency. Plasma treated in these ways removes certain components necessary for coagulation, and, when this plasma is tested with a patient's plasma, the defect in the patient's coagulation may be identified.

The usefulness of the capillary bleeding time and the coagulation time is limited. Even when the tests are well standardized they may give more misinformation than information. When blood platelets are normal in the smear, the use of the ordinary prothrombin time along with the plasma-clotting time at 37° C. will help to determine a defect in the thromboplastin generation or prothrombin conversion. The specific deficiency will not be identified, but, if one knows that the platelets are adequate and finds abnormal results in both the other tests, this information is infinitely more important than the usually performed coagulation and bleeding times. A carefully elicited family history of easy bruising or excessive bleeding after trauma is of great value in anticipating a bleeding problem in an infant. This knowledge has far more potential value than have the results of laboratory tests which cannot be accurately standardized or interpreted.

The infant in the newborn nursery with a coagulation disorder manifested by bleeding requires prompt treatment. Blood specimens should be obtained for whatever laboratory studies are indicated and available. Prompt administration of freshly drawn, type-specific blood is the emergency treatment of choice in blood loss with any coagulation defect. Freshly drawn whole blood from a normal donor contains physiologic concentrations of all the known and unknown coagulation factors. Its administration (20 ml. per kilogram of body weight) can be expected to correct temporarily almost any coagulation defect.

It is important to remember that transfused coagulation factors disappear from the circulation quite rapidly, and that within a matter of a few hours most infused factors will have fallen to less than effective concentration. Frequent infusions of fresh plasma or whole blood obviously will be necessary to maintain constant effective concentrations of plasma-clotting factors if bleeding is to be controlled.

When a coagulation defect is recognized in the newborn period it is almost always the result of a genetically controlled inability to produce an important coagulation factor. To identify specifically the causative factor may require referral to a laboratory especially concerned with coagulation problems. Diagnostic studies available in such a laboratory provide information of immense practical value in counseling parents in genetics, in the patient's prognosis, and in planning the most effective and practical substitution transfusion therapy for the future.

Bleeding associated with thrombocytopenia in the newborn—An adequate concentration of normally functioning platelets is necessary for competent hemostasis. Whereas petechiae, purpura and epistaxis are the common manifestations of thrombocytopenia in the older child, the newborn infant, having recently been subjected to the trauma of being born, will have

TABLE 5

CAUSES OF THROMBOCYTOPENIA IN THE NEWBORN

I. Decreased production of platelets
  A. Congenital bone marrow defects
    1. Absence of megakaryocytes
    2. Aplastic anemia (Fanconi's anemia)
    3. Osteopetrosis
    4. Leukemia
  B. Bone marrow damage due to infection
    1. Syphilis
    2. Toxoplasmosis
    3. Cytomegalic inclusion disease
    4. Bacterial sepsis

II. Excessively rapid loss of platelets from the circulation
  A. Massive blood loss or exchange transfusion
  B. Infants of mother with idiopathic thrombocytopenic purpura
  C. Iso-immunization to platelet antigens
    1. With hemolytic disease of the newborn
    2. Without hemolytic disease of the newborn
  D. Infants with giant hemangioma

more profuse bleeding if thrombocytopenia is present. Massive intracranial bleeding, bleeding into the genitourinary tract, or melena may be the presenting finding in neonatal thrombocytopenia. Petechiae or purpura also may be present. In view of such nonspecific bleeding manifestations, one must suggest that in any situation in which a newborn is found to have a bleeding tendency, the adequacy of platelet numbers (platelet count and examination of a blood film) and platelet function (clot retraction and tourniquet tests) should be determined.

Table 5 lists the known causes of thrombocytopenia in the newborn. The first decision to be made in evaluating an infant with thrombocytopenia is to determine whether the platelet deficit is due to inadequate production or excessive loss of platelets. It is impractical to measure rates of platelet loss. Information regarding platelet production is obtained by biopsy of the bone marrow, from which it is possible to determine the adequacy of the number of megakaryocytes, the platelet precursors. Thrombocytopenia following decreased platelet production may or may not be associated with less than normal numbers of megakaryocytes in the bone marrow.

Only in congenital absence of megakaryocytes are the platelet precursors alone affected. In aplastic anemia, osteopetrosis, leukemia and severe neonatal infections, the erythroid and leukocyte precursors in the marrow also will be reduced in number.

Platelets can be lost from the circulation in quantities sufficient to reduce temporarily their concentration in the blood as a result of massive bleeding. Following exchange transfusion, platelet counts of 80,000 to 150,000 per cubic millimeter are common. Bleeding is not to be expected at these levels of circulating platelets. Return to normal concentrations of 250,000 to 300,000 per cubic millimeter or higher, depending on the method, takes place in 36 to 96 hours.

A syndrome with grave prognosis, having associated thrombocytopenia and giant hemangioma, has been recognized with increasing frequency in recent years. A considerable amount of bleeding occurs into a vascular tumor, which rapidly increases in size. Thrombocytopenia is thought to be due to abundant sequestration of the platelets in the hemangioma. Platelet counts as low as 10,000 to 20,000 per cubic millimeter can occur in these infants. Frequently, they die early in life, due to massive hemorrhage from the ulcerated tumor or into the central nervous system. The only successful treatment is early and extensive x-ray therapy of the hemangioma. Surgical excision of the massive vascular tumor is not possible. Splenectomy is not effective.

Since the early work of Evans and associates[21] and Harrington and co-workers,[22] demonstrating the possible immunologic mechanisms capable of causing thrombocytopenia, platelet deficiencies in the newborn have assumed new significance. Iso-immunization to platelet antigens can occur in a manner like that in which red blood cell antigens are responsible for hemolytic disease from Rh incompatibility in the newborn. Previous transfusion or pregnancy may sensitize a mother to platelet antigens. Antiplatelet antibodies traverse the placenta and produce thrombocytopenia in the newborn infant. Such platelet deficits are transient, lasting from four to six weeks; a spontaneous rise in the platelet count is expected as the maternal antiplatelet anti-

bodies disappear from the infant's circulatory system.

Neonatal thrombocytopenia is most threatening to the infant during the birth process itself. Serologic technics are not currently available to identify specific platelet antigens or maternal antibodies. Thus, only from historical data can one anticipate the birth of an infant with thrombocytopenia. If a mother has had previous transfusions or pregnancies and has had a thrombocytopenic infant previously, a significant percentage of her future infants may be born with low platelet counts. Cortisone is known to reduce the bleeding tendency in thrombocytopenic states. Thus it is suggested that infants be given the benefit of such therapy to tolerate better the trauma of the birth process. This is done by giving full therapeutic doses of cortisone to the mother during the last few days of pregnancy. Likewise, if the infant bleeds during the neonatal period, treatment with cortisone may be beneficial.

Auto-antibodies against platelets have been demonstrated in the plasma of 60 to 70 per cent of adult patients who have idiopathic thrombocytopenic purpura. It is of unusual interest that a similar percentage of infants of women who have or have had this disease will be born with thrombocytopenia which usually will last for a period of from four to six weeks. Although proof is lacking, it is postulated that platelet auto-antibodies from the mother's plasma traverse the placenta, attacking the infant's platelets and causing thrombocytopenia. As in instances with isoimmunization, some protection can be afforded the baby against hemorrhage from birth trauma by administering cortisone prior to delivery of all mothers who have or have had idiopathic thrombocytopenic purpura. If the infants of these mothers bleed following birth, they may benefit from cortisone therapy.

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DR. ARTHUR G. SULLIVAN MEMORIAL LECTURE*

The Comparative Results and Treatment for Cancer of the Rectum

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London, England

The frequency of upward lymphatic spread in rectal and rectosigmoidal cancer necessitates the widest possible removal of the upward lymphatic field. Combined excision is the most radical operation; the site and extent of the lesion when first seen indicate this procedure in about 75 per cent of cases. A study of 573 operations revealed that results of anterior resection in selected patients compared favorably with those of combined excision.

C. NAUNTON MORGAN

I AM deeply conscious of the honor of being chosen to give this lecture, and, further, I am honored to think that I am giving the second lecture following a great American surgeon, Waltman Walters, who presented the first one.

This is my third visit to the Interstate meeting, and in my first two I had the privilege of meeting Arthur Sullivan, whose memory we honor with this lecture. One characteristic of Dr. Sullivan which I noticed, and which I believe to be a true one, was his forthrightness. He aimed at a goal and was not satisfied until he had obtained it, and because of that his untiring service and energy did much, I feel sure, to raise the standard of this great gathering and to make these annual meetings so fruitful. We also remember him as one of the early editors of POSTGRADUATE MEDICINE.

I am glad to be back again among friends, and I hope that on this visit I shall make more, because there is one thing sure: Friendship

*Established by the Interstate Postgraduate Medical Association in 1957 in memory of Dr. Arthur G. Sullivan, who served as Managing Director for the 17 years preceding his death in 1954. Dr. Sullivan was also Managing Editor of POSTGRADUATE MEDICINE from its inception until his death.

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Presented before the forty-third annual Assembly of the Interstate Postgraduate Medical Association at Cleveland.

between your country and mine is essential for peace, and if we do not remain friends, God help freedom.

Spread of Cancer of the Rectum

Since Miles' classic research of over 50 years ago into the paths of spread of carcinoma of the rectum, most surgeons have followed his precepts and have performed combined abdominoperineal excisions for growths in this region. During the past 28 years, the work of many—including Westhues (1934 to 1940) in Germany and Cuthbert Dukes (1930 to 1940) at St. Mark's Hospital in London—has demonstrated that submucous extension of the growth is very slight and that downward lymphatic spread is uncommon. Downward lymphatic spread occurred in 6.5 per cent of 1500 specimens of carcinoma examined by Dukes, but in only 2 per cent were the distances more than 2 cm. Furthermore, it was noted that the growths were anaplastic in 75 per cent of specimens exhibiting retrograde spread.

Lateral lymphatic spread via the pelvic fascia, the lateral ligaments and the levator muscles also is uncommon with growths situated above the level of the peritoneal reflection. This was shown by Wood and Wilkie in 1933 and by Sauer and Bacon in 1951.

Venous spread has been found in 11.4 per cent of specimens examined at St. Mark's Hospital. However, it is over four and one-half times more common in anaplastic growths, in which the incidence is 22.9 per cent, compared with 4.9 per cent in low-grade growths.

Upward lymphatic spread along the inferior mesenteric vessels toward the aorta is by far the most common route of extension (51 per cent in over 2000 specimens).

Obviously, a radical operation for the cure of cancer of the rectum or rectosigmoid must allow the widest possible removal of the upward lymphatic field, and, to avoid embolic venous spread, the inferior mesenteric artery and vein should be ligated before the primary growth is handled.

The view that restorative operations are radical procedures in suitable selected cases is supported by the infrequency of downward spread and by the fact that lateral spread occurs most commonly with growths situated at or below the level of the peritoneal sac. The results of anterior resection of growths situated above the peritoneal sac confirm this finding.

Choice of Operation

The level of the lower border of the sacral promontory was used to mark the rectosigmoid in the series of patients which will be presented in this discussion. All lesions lying or impinging on this arbitrary landmark from above or below were considered rectosigmoid.

Combined excision—The portion of the rectum lying below the peritoneal pouch is closely enveloped by the pelvic fascia and the pubococcygeus muscles; these structures always must be widely excised whenever growths situated in this region are removed. Thus, I believe that when a growth can easily be felt on digital rectal examination, restorative operations as a rule will not be radical. The lower edge of a growth which is just palpable with the finger usually is approximately 10 cm. from the anus on sigmoidoscopy. Because of the site and extent of the lesion when the patient first seeks treatment, combined excision will, in fact, be the only suitable operation and certainly the most radical operation in about 75 per cent of cases.

Combined excision in the lithotomy-Trendelenburg position (performed by Bloodgood in 1906, William Mayo in 1910, Clogg in 1923, Kirschner in 1934, Devine in 1937, and Lloyd-Davies in 1939) has many advantages. Apart from the fact that the patient is not moved during the operation, this position allows easy and simultaneous access to both abdominal and perineal fields and permits alteration in the type or plan of operation. Either one or two teams may be employed; precise anatomic dissection is more easily performed, and the pelvic peritoneum can be closed over an empty pelvis. A dual approach by two teams facilitates the excision of large, fixed, advanced growths.

With the patient in the lithotomy-Trendelenburg position, high ligature of the inferior mesenteric vessels, removal of other organs, and dissection of the ureters, etc. may be car-

ried out while the perineal dissection proceeds. By this method, difficulties due to fixity deep in the pelvis or anteriorly are more readily overcome and hemorrhage is more easily controlled. This position also is useful for performing the Maunsell-Weir abdomino-anal resection, and when an anterior resection is contemplated it permits irrigation of the lower rectum to destroy free malignant cells. While the abdomen is open, the distal large intestine also may be examined with a sigmoidoscope through the anal orifice. This method is one of the major factors responsible for the high operability (resectability) rate achieved.

Removal of the primary tumor is the only satisfactory palliative operation for carcinoma of the rectum. Palliative colostomy has little place in treatment.

Perineal excision—The two stage perineal excision of Lockhart-Mummery (1907) may still be justifiable in poor-risk patients for removing a growth situated in the lower rectum. Results of this procedure for early cases of carcinoma of the lower rectum compare favorably with those of combined excision for similar growths.

Abdominal excision—Hartmann's abdominal excision with colostomy (1923) may be extended downward to the pelvic floor. This procedure has been found useful in poor-risk patients, since it avoids a perineal dissection.

Pelvic evisceration—Except in cases in which the main extension of the growth is anteriorly into the bladder, uterus or vagina and in which lateral spread is only slight, pelvic evisceration has not found much favor. When local recurrence is likely after operation for an advanced growth, especially in the presence of lateral extension, this operation is probably unjustifiable. The quality of life takes precedence over the length of life.

Restorative Operations

To be both radical and satisfactory, any operation which aims at restoring continuity must include the removal of the same wide upward lymphatic field as that achieved by combined excision. At the same time, it must permit fully controlled defecation. The operative mortality and morbidity also must be low. Thus, sacral or perineal operations, so common in Europe at the end of the last century, have long since been discarded.

The abdominosacral approach practiced by Finisterer (1941), by Goetze (1944), and especially by Pannett in England (1939) and d'Allaines (1936) in France has not been popular because of the frequency of persistent perineal fecal fistula.

Abdomino-anal resections—These operations are of two main types: (1) the "pull-through" operation popularized by Babcock (1932), Bacon (1945) and Waugh, Miller and Kursweg (1954) and (2) the method of Maunsell (1892) and Weir (1901). The former operation, which has gained popularity in the United States, does not give satisfactory continence in the majority of cases; although the external sphincter musculature is preserved, the sensitive lining of the anal canal and the whole rectal ampulla are sacrificed and the internal sphincter often is damaged. The delicate sensory mechanism necessary for good control is thus lost; for this reason, we have discarded this procedure at St. Mark's Hospital. In the Maunsell-Weir operation, the levator muscles, the lowest portion of the rectum, the anorectal muscle ring, and the complete anal canal and its lining and mucosa are undamaged. By this method, a low colorectal anastomosis is performed from the perineum after eversion of the rectal stump, which is then returned into the pelvis. A concomitant temporary colostomy is always necessary.

The functional result in the majority of cases is good although not always perfect after the lapse of some months. However, the Maunsell-Weir operation is not commonly employed. It is used occasionally as a palliative operation and for the radical removal of papillary adenomas of the upper rectum, and it is possible only when a long colonic loop is available. Black (1952) also preserved a satisfactory rectal stump, avoiding a sutured anastomosis by pulling the colon through the anus.

Anterior resection—Provided that certain criteria are followed, anterior resection (done by Dixon in 1939 and by Mayo, Waugh, Black and Judd) fulfills all the requirements of a satisfactory operation for carcinoma of the

TABLE 1

OPERABILITY RATE IN CASES OF RECTAL AND RECTOSIGMOIDAL CARCINOMA SEEN BETWEEN 1948 AND 1957

Patients seen	703
Refused operation or seen for diagnosis only	13
Considered for treatment	690
Inoperable cases	38
Resections or excisions	652

$$\text{Operability rate} = \frac{652}{690} = 94.5 \text{ per cent}$$

rectum. The necessary criteria are as follows:

1. The lower border of the lesion must lie at least 10 cm. from the anal orifice and must be situated above the peritoneal reflection.

The sigmoidoscopic measurement, *together* with the relation of the growth to the peritoneal reflection, forms a useful yardstick in assessing the site of the growth.

2. The rectum and mesorectum for at least 5 cm. below the lower edge of the growth and a portion of the sigmoid colon, along with the interior mesenteric lymphatic field, must be resected en bloc.

3. In locally advanced growths and in those of high-grade malignancy, the chance of local recurrence is great and the restorative resection should not be employed. When the primary lesion is completely removable, secondary deposits in the liver most certainly call for restoration of continuity.

The value of anterior resection may best be judged by personal experience, since the method is then seen in its true perspective against the broad background of combined excision, the most radical operation for carcinoma of the rectum.

Operability (Resectability) Rate

In a series of 690 patients with carcinoma of the rectum and rectosigmoid who were under my care between 1948 and 1957, the over-all operability (resectability) rate was 94.5 per cent (table 1).

Most surgeons agree that every effort should be made to remove the primary tumor because of its distressing terminal effects. Secondary deposits in the liver do not contraindicate extirpation of the primary lesion. Partial hepatectomy or lobectomy, especially for isolated secondary tumors in the left lobe, is worthwhile. One of the two patients in this series who had hepatic lobectomy of the left lobe lived four years and four months; the other lived for over six years and died of a cerebral hemorrhage without evidence of recurrence.

The proportion of palliative major operations in this series was 21.1 per cent.

TABLE 2

MORTALITY IN 573 OPERATIONS

TYPE OF OPERATION	NUMBER	DEATHS	MORTALITY *(Per cent)*
Excisions			
Combined excisions	395	15	3.8
Other excisions	24	2	—
TOTAL	419	17	4.1
Restorative operations (postmercuric washout)			
Abdomino-anal excisions	4	—	—
Anterior resections	150	8	5.3
TOTAL	154	8	5.2

TABLE 3

MORTALITY IN MEN AND WOMEN

TYPE OF OPERATION	MORTALITY (PER CENT)	
	Men	*Women*
Combined excisions	3.8	3.7
Anterior resections	7.5	2.9

Operative Mortality

Excluding 58 major operations performed by colleagues on my behalf and 21 very early carcinomas treated by local excision, there were 573 major operations in this personal series. Analysis of these operations is shown in table 2. The operative mortality for all synchronous combined excisions was 3.8 per cent; that for anterior resections was 5.3 per cent. The mortality in cases treated at St. Mark's Hospital was lower: combined excisions 3.0 per cent, anterior resections 3.4 per cent. The markedly lower mortality for anterior resections in women should be noted (table 3).

TABLE 4

RELATIONSHIP OF SUTURE LINE RECURRENCES AND MERCURIC WASHOUTS

	NUMBER OF CASES	SUTURE LINE RECURRENCES	
		Number	*Per cent*
Washouts	148	2	1.4
No washout	14	3	21.4

Implantation of Malignant Cells at Operation

The possibility of implanting malignant cells at operation was first brought to my notice in 1936, when implantation occurred at the suture line following an anterior resection. This hazard, confirmed by the investigations of Goligher, Dukes and Bussey at St. Mark's Hospital (1951), showed that implantation of growth at or near the suture line accounted for approximately 50 per cent of the recurrences. In an effort to overcome this danger, it has been our practice since 1948 to use a 1 in 500 solution of mercury perchloride for irrigating the rectal stump after applying an exclusion clamp at least 5 cm. below the lesion. This is easily accomplished with the patient in the lithotomy-Trendelenburg position. The proximal end of the colon also is swabbed with the same solution; particular attention is paid to the divided ends of the bowel. Since this technic has been employed, the local recurrence rate has been only 1.4 per cent in 148 cases. Before this method was tried, the incidence of recurrence in a small series had been as high as 21.4 per cent (table 4). Similar precautions are used during removal of growths of the colon. Control of malignant cells lying in the lumen of the intestine has been further attempted by the use of occlusion tapes above and below the growth, as suggested by Warren Cole and co-workers. When possible, the peritoneal surface of the growth also is covered with waterproof material.

Survival Rate

It often has been stated that the prognosis for carcinoma of the rectum situated above the peritoneal sac and for carcinoma of the rectosigmoid is better than that for infraperitoneal growths. Recent analysis of 3,042 operations for carcinoma of the rectum and rectosigmoid performed at St. Mark's Hospital between 1928 and 1952 should present an over-all picture of the prognosis. However, the prognosis in this large series does not appear to be appreciably affected by the site of the primary growth. Furthermore, the operability rate for growths at varying sites is also about equal.

TABLE 5

SITE OF PRIMARY CARCINOMA IN 150 RESTORATIVE ANTERIOR RESECTIONS

SITE	NUMBER	PER CENT
Supraperitoneal rectum (upper third)	76	50.7
Rectosigmoid	66	44.0
Multiple sites	5	3.3
Middle third of rectum (partly above and partly below peritoneal reflection)	3	2.0

TABLE 6

COMBINED EXCISIONS AND ANTERIOR RESECTIONS IN GRADES 1, 2 AND 3 UPPER RECTAL AND RECTOSIGMOID CARCINOMAS

CARCINOMAS (GRADE)	TYPE OF OPERATION (PER CENT)	
	Excisions	*Anterior resections*
1	8.8	20.8
2	36.0	36.1
3	55.2	43.1

The principal purpose of this lecture is to present the comparative survival rates following combined excision and anterior resection. In the series of patients studied, the site and extent of the lesions subjected to anterior resection were quite different from those treated by combined excision. The site of growths in which anterior resection was employed is shown in table 5, and the comparative extent of those treated by either combined excision or anterior resection is shown in table 6. Over twice as many early or grade 1 cases and fewer grade 3 cases are included in the series of

TABLE 7

FIVE YEAR SURVIVAL RATES

TYPE OF OPERATION	SURVIVAL RATE (PER CENT)		
	Men	*Women*	*Total*
Combined excisions			
Radical	49.9	64.7	55.1
Palliative	6.5	5.0	6.0
TOTAL	40.7	53.9	45.2
Anterior resection			
Radical	51.2	76.9	63.1
Palliative	—	—	—
TOTAL	41.1	62.0	50.7

TABLE 8

UNCORRECTED FIVE YEAR SURVIVAL RATES

TYPE OF OPERATION	SURVIVAL RATE (PER CENT)		
	Men	*Women*	*Total*
Combined excisions	40.7	53.9	45.2
Anterior resections	41.1	62.0	50.7

TABLE 9

CORRECTED SURVIVAL RATES*

TYPE OF OPERATION	SURVIVAL RATE *(Per cent)*
Combined excisions	78.5
Anterior resections	76.9

*Corrected for extent of growth, sex, and deaths due to intercurrent disease.

TABLE 10

RESTORATIVE OPERATIONS FOR RECTAL CARCINOMA*

OPERATIONS	NUMBER
Major operations	573
Restorative resections	154
Anterior	150
Abdomino-anal	4

*Proportion of restorative operations $= \frac{154}{573} = 26.9$ per cent.

anterior resections. In fact the more favorable growths were treated by anterior resection. The comparative survival rates following radical anterior resection and synchronous combined excision show, as would be expected, that the former operation gives a better prognosis (table 7).

A true picture of survival can be given only by comparing results for growths at the same site and of similar extent and by taking into account the influence of sex and age on the prognosis. Table 8 demonstrates the fact that the survival rate following all operations for carcinoma of the rectum in women is much better than that in men.

It would have been undesirable to treat two test series of cases exclusively by one or the other of these operations. Thus, in order to compare their value, the survival rate following operation on growths of similar sites and extent in patients of the same age and sex who were treated by combined excision *before* anterior resection was being employed was compiled at St. Mark's Hospital. The corrected five year survival rate for this group of patients was 78.5 per cent (table 9).

The crude survival rate following 122 radical anterior resections has been shown to be 63.1 per cent (table 7), but when this was corrected for age and sex, the survival rate was 76.9 per cent (table 9). It is seen, therefore, that anterior resection has a place in treating selected cases of carcinoma of the rectum. In this series, 26.9 per cent of carcinomas were selected as suitable for anterior resection (table 10).

High Ligation of Inferior Mesenteric Vessels

Most surgeons will agree that high ligation of the inferior mesenteric vessels should permit a more radical operation. This procedure has been carried out in 214 cases of carcinoma of the rectum and left side of the colon, with one operative death attributable to ischemia and one further unrelated fatality.

Before high ligation of the inferior mesenteric vessels was practiced, the incidence of "C2" cases (the presence of a malignant gland immediately below the site of ligature) was 16

TABLE 11

INCIDENCE OF C2* BEFORE AND AFTER HIGH LIGATION

PERIOD	C2* CASES *(Per cent)*
1948 to 1951	16.8
1952 to 1957 (High ligation in 50 per cent of patients†)	13.8

*Presence of malignant gland immediately below site of ligature.

†Incidence of C2 in patients subjected to high ligation was 8 per cent.

per cent in a series of 206 cases of carcinoma of the rectum and rectosigmoid. After adoption of this procedure in suitable subjects, the incidence of C2 cases was 13.8 per cent in 329 cases (table 11).

These figures suggest that the routine use of high ligation in suitable patients may result in converting approximately one in eight C2 cases into "C1" cases (presence of an uninvolved lymph gland immediately below the site of ligature). This may seem a poor return for the increased effort, but it is pointed out that because the operation in the majority of C2 cases often was palliative, due to distant metastases, high ligation was not performed. Otherwise, the proportion of conversions following high ligation would have been higher.

In the 162 cases in which high ligation was performed, the incidence of C2 cases was only 8 per cent. Only time will tell to what extent prognosis may be improved by this maneuver.

Careful follow-up of patients subjected to anterior resection is important, since the most common sites for the development of a second primary growth are the distal colon, which may have been retained, and the rectum. A second primary neoplasm has been encountered in 3 per cent of cases.

Comment

The results of treatment by anterior resection compare favorably with those obtained by combined excision, and the happiness and gratitude of the patients fortunate enough to be selected for restoration of continuity are indeed an adequate reward for the surgeon.

1959

INTERSTATE POSTGRADUATE MEDICAL ASSEMBLY

Nov. 2-5 Palmer House Chicago, Illinois

Talking With the Patient

The basis of medical practice is communication with the patient, but many physicians are unable to elicit pertinent information. Sympathetic and provocative questioning may provide a brief panorama of the patient's background, aspirations and life experiences. Skillful conversation will afford valuable diagnostic leads.

STEWART WOLF, M.D.

Associate Professor of Medicine, Cornell University Medical College, New York

Low Back Pain

CARROLL B. LARSON*

State University of Iowa College of Medicine, Iowa City

I HAVE been interested in low back pain for many years and, indeed, have been a fellow sufferer. If I say anything which sounds new, it will only prove the definition that originality is nothing but undetected plagiarism.

CARROLL B. LARSON

Most backaches are due to mechanical derangement of the spine.
An x-ray should always be made to rule out disease and establish a base for evaluating present and future degenerative changes.
Physiologic degeneration of intervertebral disks can produce pain, especially if there is concomitant instability.
Spondylolisthesis produces pain only if the underlying disk deteriorates.
Ruptured disk is not the major problem in low back pain, and operation is not mandatory in all cases.
Incorrect posture can lead to back pain and prevent the natural healing process.

Importance of Roentgenograms

The cartoon in figure 1 is shown to emphasize the need for x-rays in cases of low back pain. I think anyone who has a back problem should have an x-ray. Even though you may anticipate that it will be normal, it is still worthwhile from the standpoint of having a common base from which to start; there may be a recurrence of the backache later, and you will then know what changes have or have not occurred.

The most important reason for taking an x-ray is to rule out disease, e.g., metastatic disease, infection, tuberculosis, rheumatoid arthritis. An example of how the simple taking of an x-ray frequently can rule out disease is illustrated in figure 2. The patient came to see me because he had a so-called ruptured disk, and was sent in for an operation. The x-ray of his lumbar spine shows some degenerative changes, hypertrophic lipping, and some loss of density of bone, but actually not of such a degree that one would suspect any-

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thing serious. Further x-rays were made, and figure 3 illustrates the marked erosion that had occurred in the inferior necks of the femora. The case turned out to be one of multiple myeloma. We did not have to investigate further from the standpoint of a ruptured disk, so the x-ray in this instance was extremely helpful.

Similarly, in figure 4 you can see that one sacro-iliac joint is gone. Something is going on here—rheumatoid arthritis, tuberculosis—and the idea I am trying to put across is that you must run down the diagnosis after you know there is something wrong in the x-ray.

After you have ruled out disease processes by means of x-rays (and keep in mind that metastatic disease or infection may not be apparent on x-rays until the patient has had three or four months of continuous pain), then the x-rays will be meaningful to you. Assuming that disease has been ruled out, I will get right to the crux of the problem and say that I think by far the majority of backaches, the "garden variety" you see day after day, are due to mechanical derangement of the spine.

Stability and Instability of the Spine

Figure 5 illustrates sagittal sections of the spine, with the disks bulging because they have an intrinsic turgor with pressure. An intervertebral disk has, as one of its functions, the pushing apart of two adjacent vertebrae. It will push these vertebrae apart as far as the anterior-posterior and circumferential ligaments between them will allow. This means that the spine at that segment or that unit is kept under tension. This is the stability mechanism of the spine. If you strip all the muscles and other ligaments away, leaving only this unit holding the spine from the sacrum, it will remain upright due to this stabilizing mechanism of the disk unit.

We know that at the age of 21 years most of us begin to deteriorate as far as the intervertebral disks are concerned. Degeneration is a physiologic process. It occurs in everyone to a greater or lesser degree. If great, the process becomes symptomatic and begins to cause low back pain. Aside from physiologic deterioration, what other factors precipitate

FIGURE 1. *"One more dance, and if he is still in pain we'll have to x-ray."*

or aggravate this degeneration? One is the mechanics applied to the spine, the force applied to the disk areas. If excessive, it produces cracks in the cartilaginous annulus that surrounds the disk, and fluid is absorbed. The disk loses its intrinsic expanding capacity and settles down, and as it does so it changes the mechanics of the spine. It is this change which I think accounts for most cases of back pain.

I have described the normal stability of the spine and how failure of the stable mechanism results in instability. Figure 6 is a diagrammatic representation of what I mean by instability. Normally when a vertebra moves backward or forward on the vertebra below it, it does so through the disk in a sort of rolling motion. If the disk is deteriorated, at times this rolling motion is lost and there is backward or forward sliding of one vertebra on top of the other in motion. This I should like to term instability as the result of a degenerated disk. When this instability occurs it causes pain, and it accounts for a great number of the pains we encounter in the common problem of low back pain.

Mechanisms of Pain in Degeneration

There are three ways, I think, in which degeneration produces pain. One is by referred

FIGURE 2. X-ray of lumbar spine of patient referred for operation for "ruptured disk."

FIGURE 3. Same case as figure 2. Marked erosion in inferior femoral necks. Patient had multiple myeloma.

FIGURE 4. Sacro-iliac deformity in patient with low back pain emphasizes the importance of x-rays in diagnosis.

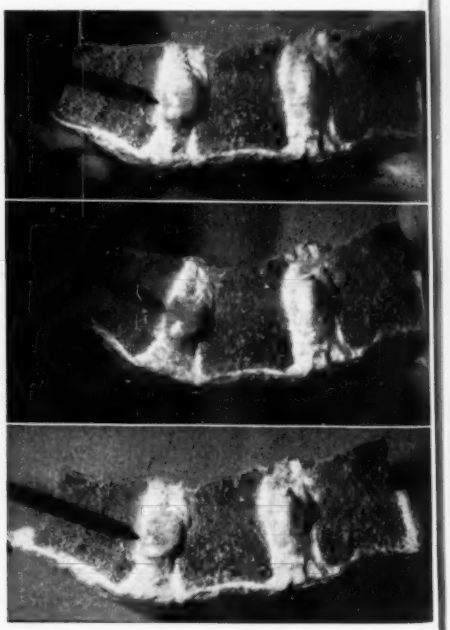


FIGURE 5. Sagittal sections of the spine. Disks bulge because of intrinsic turgor with pressure.

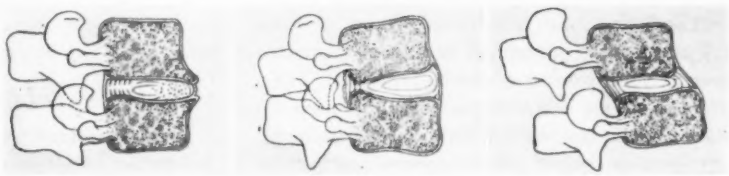


FIGURE 6. Diagrams depicting instability of the spine resulting from disk degeneration.

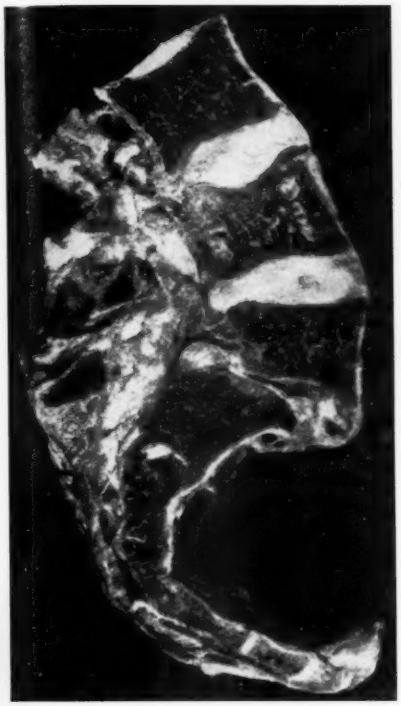


FIGURE 7. Deteriorated disk in an intervertebral area of spondylolisthesis.

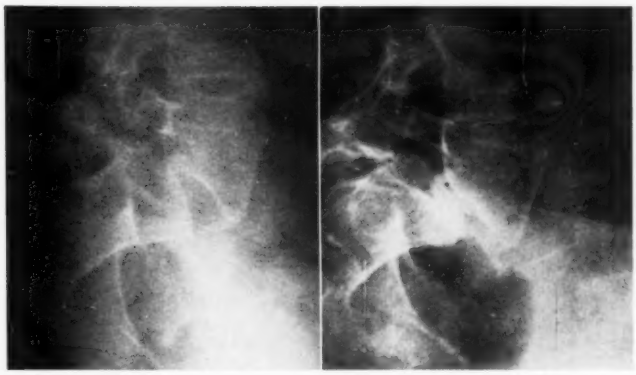


FIGURE 8. Spondylolisthesis was an incidental finding when the film on the left was made; patient was asymptomatic. Ten years later the patient had back pain, and the film on the right was made.

pain. The annulus fibrosus has nerve fibers in it; the ligaments have nerve fibers. When inflammation is present (incident to nature's attempt to heal this degenerative process), this inflammation is the afferent stimulus to pain. It goes into the spinal cord and comes back out on a referred pattern of the same nerve segment. The referral frequently is down the leg, simulating sciatica, but this is not true sciatica. The second pain mechanism is true radiation. The nerve root itself has been impinged upon, either by the body of the vertebra above pinching it as it moved backward or by excessive bulging of the remainder of the degenerated disk. This type of pain has a true segmental distribution. You can follow it according to the anatomy book. This is true radiation pain; this is nerve root pain. It means something as far as localization of the lesion is concerned. The third type of pain, which is so confusing to most of us, is pain in the muscles themselves. The muscles are painful because they are in spasm, attempting to stabilize the unstable spine. If you make a fist for 20 minutes, as hard as you can, your arm will ache. This muscle spasm accounts for a great part of the ache in backache, and a very easy remedy is to provide the spine with a little support so that nature's own muscular apparatus does not have to provide the necessary stability.

Spondylolisthesis

Spondylolisthesis, the most common condition affecting the back, occurs in about 5 per cent of the total population. In itself it frequently is not painful. It becomes painful when and if the underlying disk deteriorates. Figure 7 is a photograph of a pathologic specimen of such a deteriorated disk in an intervertebral area of spondylolisthesis. The condition was very painful because of instability, not because spondylolisthesis was present; in other words the pain in spondylolisthesis is identical to all the other types of low back pain when due to degeneration of the disk.

Figure 8 shows two x-rays in such a case of spondylolisthesis. The one on the left was made when the patient was asymptomatic. The spondylolisthesis was an incidental finding. Ten years later I saw the patient because of back pain, and the x-ray on the right was taken.

FIGURE 9. Deterioration of disk in absence of spondylolisthesis.

The only difference is a marked narrowing of the disk.

Figure 9 shows the type of deterioration of a disk that can occur in the absence of spondylolisthesis: narrowing of the disk, and spur formation at the anterior margin of the bodies of the vertebrae, of the contiguous disk. These are signs of deterioration at that level. They can be physiologic and can occur without producing symptoms, if concomitant instability is not present. Recently I saw an x-ray of a 70 year old woman who had marked changes like these at four or five levels, without back pain. On the other hand, minor degrees of the same type of change can be painful if there is additional instability.

Ruptured Disk

Figure 10 is a diagram of a ruptured disk, which, I should like to state, is purely an incident in the life of a deteriorated disk. I doubt if you can rupture a normal disk; it has been attempted many times experimentally. If a disk is deteriorated and if abnormal pressures are applied to it, a portion of it can be ruptured backward, producing true radiation pain. This actually occurs in a very small number of degenerated disks, so it is not the major problem in regard to low back pain.

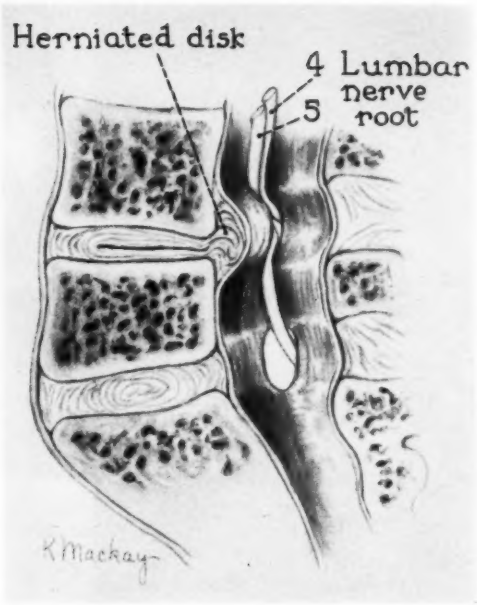


FIGURE 10. Diagram of ruptured intervertebral disk.

Relation of Posture to Back Pain

In the management of back pain, the only factor I know of that we can control medically is the incident strain to the area of a disk which has already deteriorated physiologically. If we can prevent strain in this area, to start with, or prevent further strain once degeneration has occurred, we can control the symptoms. This is why back pain is not a disease. It is purely a symptom, and we are attempting to control only the symptom, not the underlying deterioration.

It is obvious from the drawings in figure 11 that posture has something to do with intervertebral tension. If a patient has a deteriorated lumbosacral disk and bad posture, as indicated in the center drawing, undoubtedly there is more strain incident to that disk level than there normally would be. This, then, can become productive of pain. So far as I am concerned, posture is a very important issue. I doubt if poor posture will necessarily produce pain unless deterioration of one of the disks sets in. We then should correct posture

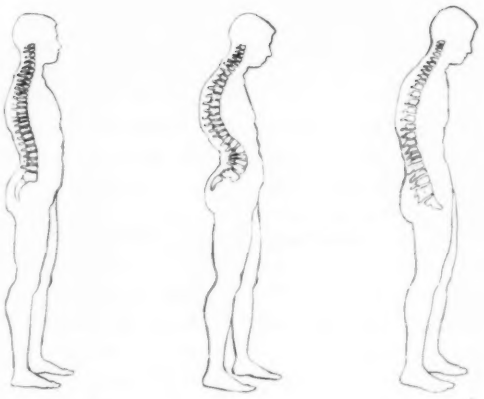


FIGURE 11. Posture is an important factor in the development of intervertebral tension and the production of pain in the presence of disk deterioration.

as far as possible, to put one brick (vertebral body) on top of the next brick rather than having them off at a sheering slant.

Sitting becomes an important issue to a person who has chronic back disease, because if he continues to move and strain the degenerated area nature has little opportunity to heal the process. And nature does heal it, by fibrosis of the surrounding ligaments, mainly; but if the area is continuously moved and strained, nature's fibrosis does not produce this cure.

In the drawing in figure 12, the incumbent body weight is transmitted to the lumbosacral area. Obviously there is more strain on the posterior longitudinal ligament and the interspinous ligaments than elsewhere. Because of this brake-shoe at the back, the remainder of compression due to body weight must compress the disk anteriorly. This is an abnormal amount of pressure, particularly if it is sustained for any length of time. It is well known that the disk acts as a shock absorber and will take care of a quick bump just as a hydraulic shock absorber will; but in a persistent, continued position the fluid tends to equalize in a different way, even to the point of absorption. Thus improper sitting is one of the things that may initiate degeneration of a disk, and it certainly can perpetuate it. Proper sitting is important. In a soft, deep upholstered chair one must sit the way this drawing indicates; it is impossible to sit up straight. That is why deep-cushioned davenports should all be burned, in my opinion.

Figure 13 shows the proper way to sit. Many persons who have chronic low backache have a major part of their trouble in trying to drive a car. Adjusting the seat of an automobile properly is not a matter of tilting or of back-

FIGURE 12. Improper sitting posture may initiate disk degeneration, and certainly can perpetuate it.

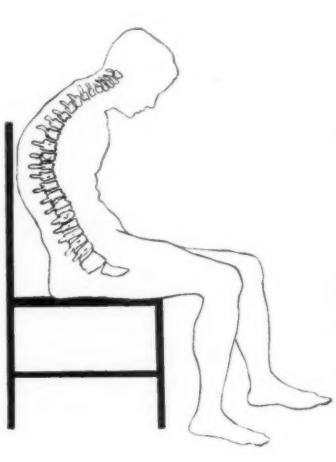


FIGURE 13. The proper way to sit.

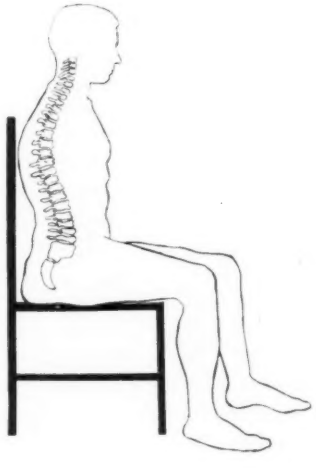
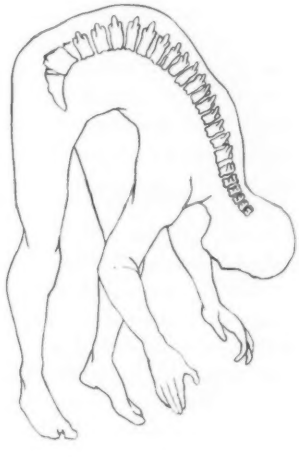


FIGURE 14. This position should be avoided at all costs. It will aggravate disk deterioration and may actually begin it.



and-forth positioning, but depends on how well the low back is supported. Most of us "scootch" down in our seats, as shown in figure 12. If you maintain this position for a long time driving a car, you end up with a backache. If you sit straight, perhaps with some support behind the back at the level of the belt, such as a cushion, you will not have undue strain and will not have pain in the back after a trip. I cannot overemphasize the importance of a proper sitting posture.

The position shown in figure 14 is one we all assume frequently. Housewives assume it innumerable times a day picking up after the youngsters. It places enough strain on the lumbosacral disk—just this position alone, with the hamstrings tight, the superincumbent weight acting through the hinge (the lumbosacral junction)—to increase the compression on this space alone four or five times. Persisted in day after day, this position not only is apt to aggravate deterioration but can actually begin it. This accounts for the frequency of low back pain among housewives and in many industrial areas. This is a position to be avoided at all costs. It is not a natural one for upright bipeds. A monkey bending forward always bends the hips and knees. We should do likewise. Bending the hips and knees places the strain at the hip as the hinge rather than at the lumbosacral disk, and is enough to prevent deterioration or to allow it to heal rather than progress.

The patient with low back pain must be trained and must understand precisely what we are attempting to do to control the pain. This takes a little time, and we as doctors default, I believe, many times in spending insufficient time to illustrate exactly what we are trying to accomplish.

Proprioceptive Sense of Back Muscles

Another factor that deserves mention here is the proprioceptive sense of the muscles that control the back. One does not stop to think about one's back when bending over to pick up a lady's handkerchief. The muscles have been accommodating to this type of movement so long that a secondary proprioceptive sense has developed. Take the same picture and try to change it in any way and you must redevelop a new proprioceptive sense. I would venture to say that the average physician in this audience, if he were to stand up, would have trouble describing the degree of lordosis he has at that moment. This, again, is a loss of proprioceptive sense. To redevelop it takes more than just instruction. This is where I feel a low back brace is extremely helpful. A low back brace in the form of a metal support (not a corset) to be worn long enough to redevelop this proprioceptive sense gives the patient a guide. The back can be brought to touch the brace, and by doing this repeatedly the back develops its own proprioceptive sense and the brace then can be discarded. The brace is intended not to support the back but to redevelop this proprioceptive sense in the proper use of the back. The average period required to do this, in my opinion, is four to six months, and some patients will be unable to develop it. They are incoordinated from the beginning, and present another problem.

What to Do for Acute Backache

Acute backache is the type that most of you see in patients' homes. Many times you are called because someone is unable to get out of bed, or even to make it to bed. You may find the patient lying on the floor. What do you do about it? In this situation I believe you need to make only a cursory examination. Be sure the patient can move both legs, can dorsiflex the feet and toes, and has sensation and reflexes. In other words, rule out any acute expanding neurologic lesions which would need immediate compression. Having ruled these out, the diagnosis is relatively unimportant for the time being. Keep the patient at bed rest to get over the muscle spasm. If it is a plain backache due to mechanical derangement, frequently the patient will be completely well after 48 hours of bed rest and good sedation and a little heat on the back. The best weapon we have to combat manipulative treatment is bed rest, and if the patient has repeated attacks he soon learns this for himself.

If the pain persists beyond 48 hours, it is up to you to establish a diagnosis, if you can. This requires more detailed examination,

sometimes even hospitalization, certainly x-rays, and perhaps some of the other tests, even myelograms or discograms. These latter tests, I think, should be in the hands of someone experienced in performing them and in interpreting the films. Many times it will still be found that the cause is degeneration of the disk, and the patient will be returned to you for the kind of care already outlined.

Treatment of Ruptured Disk

In my own practice, about one-tenth of all the patients with backache have disk surgery. This does not mean that perhaps more should not have had operation. It could even mean that I operated on some who should not have had surgery, but it gives a perspective of the status of ruptured disk in relation to the whole problem of low back pain. It really is an insignificant part of the whole problem. Nonetheless, when it occurs it is more acute and persistent than the other conditions. As far as I am concerned, there are only two indications for surgical treatment of ruptured disk. The majority of cases, even with nerve signs, will clear up spontaneously if the patient is willing to withstand the discomfort for up to six months. The two reasons to operate are (1) if the patient demands it for relief of pain and (2) if there are progressive neurologic signs indicating increasing damage to a nerve root.

In regard to the first indication, one must evaluate the patient before accepting his demand for an operation. If I had a terrific amount of pain and insisted that something be done to relieve it, and the only thing left to do was to operate, that would be an acceptable indication. The second indication for operation means that you must make weekly, if not daily, neurologic examinations to find out if there is progression. Many patients will elect to have conservative treatment knowing that the possibility of a favorable outcome without surgery is in the range of 80 per cent.

I mentioned the indications for operative treatment of ruptured disk because often we are apt to think that it is mandatory to operate in such cases, and this is certainly far from true.

Exercise in Treatment of Low Back Pain

After an extensive survey of this question, we have found that normally the ratio of strength of back muscle to abdominal muscle is about three to one. Whenever there is a deviation from this ratio, that person is in line for a backache. We frequently find a ratio of, say, six to one, and such a person can be expected to have a backache in the very near future. We therefore try, in all chronic back problems, to re-establish this ratio of three to one for strength of back muscle to abdominal muscle, and more times than not this requires strengthening mainly the abdominal muscles. After all, the abdominal muscles are the mainstay of the spine, and if they are weak we must do something about it. The mode of living today is very conducive to the development of weakness of the abdominal muscles. A very simple exercise to strengthen the abdominal muscles is just to lie on your back on the floor with your feet under a radiator or some other immovable object and do sit-ups without using the hands. You cannot do this with a painful back, and therefore the pain must be treated first. When the patient has reached the point where he is relatively comfortable most of the time, he can start exercises.

I think the average practitioner can handle the average case of backache up to a point, and this point will be reached in a very few of the total number of backaches.

Behavior Problems of Children

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Children at any age know how to get what they want. The dividends they desire should accrue to them for being good, social human beings, not for misbehaving.

Inconsistency and undependability in parents' attitudes toward children greatly affect their feeling of security. Putting pressures on children may lead to bed-wetting, stuttering and stammering.

It is important to recognize the pressures and influence of "the gang" and strive to keep it acceptable.

Love within the family, not just spoken but lived, is a necessary factor for emotional development.

I WANT to talk for a few minutes about rearing children. I might entitle this "Let's not raise hellcats."

Behavior problems begin very early—so early that sometimes it scares us. By the time they are recognized as problems, frequently it is too late to do a great deal about them. There is a great religious denomination which says, "If you will give me your child until he is seven years of age, you may have him after that and he will stay in this religion." If they worked on it very hard they could move that time down to six or even five years of age; we know that the emotional pattern is established pretty well by the time a child is six.

The first point I want to make is that children work on a dividend basis. They do things that to them bring dividends. This is not peculiar to children. You and I also work on a dividend basis. We will not consistently do things which do not bring us some sense of satisfaction. I am not talking about money alone, although that may be one part of it. You and I even choose our associates this way. If somebody doesn't give us a dividend, if he rubs us the wrong way, if we aren't comfortable in his presence, we find some excuse or logical reason not to associate with him; we have a convenient headache or a previous engagement.

Children do not have that finesse. They work

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quite directly. For instance, a six week old child knows when it pays to cry. If he cries for five minutes and his mother takes him up, he gets what he wants; he gets a dividend, her attention. He cares little about diamonds or Cadillacs, but he wants the attention of his mother. Then he starts crying again, and she gets stiff in the back and strong-willed and says, "I'm not going to take him up; I'm going to let him cry it out." She lets him cry for 10 minutes, gets weak-kneed and cowardly, and takes him up, and he has won again. The third time he starts to cry, she says, "I'm really not going to spoil him; I'm going to leave him alone," and she does—for 20 minutes. Then she cannot tolerate it any longer and takes him up. He has won three times. He is getting the dividend he desires by crying. We call him a spoiled child, but he is a very well-educated individual; he knows what to do to get what he wants.

This is the point: It behooves us to know what these children desire for dividends and let that accrue to them for being what we call good, social human beings. Sometimes this is beyond the ken of parents, and they cannot determine what it is a child wants. I have in mind a little girl who, each time her mother had company, got a spanking on purpose. Before, during and after the spanking she got her dividend—she was the center of attention. She suffered pain on her bottom in order to be the center of attention. We stopped her very easily by asking the mother to take her in and give her some sort of a dividend before she had an opportunity to be bad. The mother took her in, introduced her to the company and said, "This is my little girl, Mary Jane. Don't you think she is a nice little girl?" And they all shook hands with her. Her chest came out about 2 in. She got the attention without having to be a bad girl. Let it accrue to them for doing those things we consider good.

These children know that by making nuisances of themselves, by raising enough cain, they get what they want. They have insight; they know they can do it. I saw a little boy not too many years ago who was getting obese, and his mother and I both thought he should stop gaining weight. I asked him, "Does your mother allow you to eat between meals?" He answered, "No, Dr. Young, she doesn't, but if I ask her 10 times she will." He knew how to get what he wanted by being a nuisance.

Did you ever see anybody throw a temper tantrum? A temper tantrum is nothing in the world but a dividend-getter. It takes an audience to have a temper tantrum. The child who has a good temper tantrum when his mother takes something away from him or denies him something or crosses him, who falls on the floor, kicks his heels and bumps his head, looks like he is having epileptic convulsions, but he isn't; he is having a temper tantrum. If he does not have an audience he won't do it.

How are you going to control these things? By not allowing them to pay dividends. Go off and leave that boy or girl alone, and after a time—not immediately, but after a time—he or she will stop having temper tantrums. I told this to a mother one time and she began doing what I suggested, but she made the mistake of going out in the hall and looking in the room in a mirror and watching her son. He had about decided it was not profitable to have temper tantrums when he looked in the mirror and saw his mother's reflection and started all over again. These children have insight. We should therefore remember not to do things for them if they are bad, if they are unsocial human beings, but to let it accrue to them for doing those things that are good.

The next point I want to make is that consistency and dependability in attitudes toward children have a great effect on their feeling of security. You have heard the phrase "sense of security" many times. If we are inconsistent and undependable in our attitude toward our children, they frequently do develop this sense of insecurity. If you are going to be puritanical part of the time, be puritanical most of the time; if you are going to be easygoing and lackadaisical, then let that be your attitude toward children, but do try to be consistent.

Mothers frequently are inconsistent and undependable in their attitude toward children during the day, because the mother becomes tired. Well, sometimes children also get tired toward the end of the day. Frequently in a

family there may be very little friction, if everybody is physically well, until around four or five o'clock in the afternoon when everybody gets on everybody else's nerves. You can call it emotional exhaustion or nervous instability or whatever you wish, but there are more friction scenes, more punishment, more scoldings and spankings in that part of the day than in any other; the mother gets tired and sometimes so do the children.

How are you going to control it? Just recognize the fact that it does occur, and the mother should strive therefore to have those children in about the same attitude throughout the day.

Fathers vary a great deal from day to day. You come home one day and everything is lovely and the goose hangs high; you have had a wonderful day and you feel fine, you have accomplished something. The children run to you and grab you around the knees and you are a good fellow and a good papa, a good daddy, a good person to have in the household and everything goes well. The next day things don't go well where you labor. Somebody steps on your toes, you have a very unsuccessful day, and besides that you have a headache. You come home worn out, and those same children run to grab you around the knees and you reject them, perhaps; you say, "Leave me alone, I'm tired, I have a headache, I want to read my paper in quiet and solitude." To be rejected hurts, and frequently these children who are rejected do develop a sense of insecurity which persists. I often tell fathers, "It might be worthwhile to give yourself a lecture on the way home, saying, 'I'm tired, worn out, I don't feel good, but as long as the children are up I'm going to be a pretty good person, a pretty social human being.' When the children go to bed you can then take it out on your wife; she should be able to tolerate it pretty well."

Not only should mothers and fathers be consistent in their attitude toward children, but I feel also that the two should be consistent in their attitude together. I do not mean being mimics of each other, but if one is strict and puritanical and the other easygoing and lackadaisical there frequently is trouble. Most often in my experience the mother is the one who takes it slow and easy—and of all the words about child guidance and child behavior problems I think "slow and easy" are the very best. Take it slow and easy with children. Throughout the day a child has learned that he can take it pretty slow with his mother. He goes at a slow trot or a walk. She asks him to do something and in a moment she forgets what she asked him to do and he forgets what it was and it doesn't matter much anyway and no one has any trouble. But when papa comes home, he is the executive type and frequently things have got to happen and happen right now; he tolerates no hesitation, no maybes.

Did you ever hear about the man who kept three cats and had three holes cut in his door? When a friend asked him what the holes were for, he said, "To let my cats out." The friend laughed and said, "Didn't you know they could all go through one hole?" The man answered, "You don't know me. When I say scat I mean scat!" Some fathers are like that. I know children who are so tense and tight when their fathers come home that they can hardly do anything right. They have taken that slow, easy attitude during the day. My advice is that we do strive, with growing children—who are evolving into adulthood, who are seeking emotional security—to make it as easy as we can for them, taking pressures off.

In this group under pressure and in an inconsistent environment, we see children with enuresis and stuttering and stammering and other things, besides those deeper emotional problems which do not show themselves in a physical manifestation. In my experience, most of the enuresis I see is due to this type of thing or something I call pressure. I am going to give you some examples and digress for a moment to say what I mean by pressure. If we put pressures on children, they frequently have this sense of insecurity and may become bedwetters or stutterers or stammerers or something else.

What do I mean by pressure? I mean pressuring children. Jimmie is a nice little boy, but he drops his pajamas on the floor. That is not a heinous crime, but his mother wants him to be neat so she says with an authoritative voice, "Jimmie, pick them up!" Inside,

Jimmie vibrates and gets tense and tight, and he may become a bed-wetter or a stutterer or a stammerer. "Hurry! Hurry! Hurry! Don't do that! Don't do this!" That is pressure, and frequently causes trouble. Try to relieve children of that pressure. I am for discipline, don't misunderstand me, but not for pressure.

There is a four letter word that will help you avoid putting on pressure of this nature. It is "well," w-e-l-l. You can hardly say "well" and then hurry. You don't say, "Well, I am going downtown"; you say, "Well, I guess I'll go downtown." If you find yourself in this position, as many of us do, if you can slow up and take it easy the children will benefit.

This sense of insecurity which develops in childhood frequently persists so that sometimes, if it develops to such a state, psychiatrists try to correct and ameliorate the symptoms and cure the patient later in his life. We frequently can do something in childhood, if we will.

The third point I want to make is that other people influence us and our children also. The so-called herd instinct, the group pressure, the gregarious instinct has a great influence on every one of us. Did you ever get kicked out of or withdrawn from, "churched," ostracized, or lose caste? If so, it pained you. You may rationalize and say, "I was about ready to quit that group anyway," but still it is painful to your emotional system. Children feel this very strongly. It doesn't begin in the cradle with the crying baby, but it does begin in the preschool age sometimes. I have in mind a little boy who played every day with the children in his block and was happy and well adjusted until one morning the children rejected him. "We don't want to play with you. Go home. We don't want anything to do with you." The boy went home and spent a miserable day. He had no companionship; he was rejected, ostracized; he had lost caste. This may sound melodramatic, but sometimes adults commit suicides because of being rejected, of losing caste. A man who lived not far from me worked in a bank as a cashier and was very well thought of in his community, in his church, in civic activities. One day the bank examiners came and he shot himself because he was an embezzler. Why did he do it? The most he could have received as a sentence would have been a few years; he would not have been put to death. He couldn't tolerate losing caste, being ostracized by those he knew, and so he destroyed himself.

It is not unusual for adults to commit suicide for such a reason, though children seldom do it. I know of one child in Dallas who, when he was rejected by his playmates in junior high school—his gang, so to speak—went home and hung himself in his garage, but that is rather uncommon in childhood.

There are three things you can do, perhaps, to aid in the adjustments and pressures of the gang. First, you can forbid association with a group that is sinful or criminal or delinquent. We still have our big feet, and we can put them down if the gang is harmful. Find something else to do. The damage to be done by association with such a group in order to have their approval and approbation is worse than doing without.

Second, you can run away from it. I have in mind a little boy who was transferred to another school in the fourth grade when his family moved and who was rejected by all the fourth-grade boys. They ridiculed him, would have nothing to do with him; they didn't accept him and he couldn't play with them. He wore glasses, and they called him "four eyes." Could I go to the children and tell them to accept this boy? Could I tell them, "He is a fine boy"? No. Could the principal? No. Could his parents? No. Children sometimes are the meanest people in the world. When they find a point that is tender and sore and painful they pour acid in and use an auger to make it worse. We ran away from it; we transferred the boy to another school. No one called him "four eyes"; he was accepted, and he was very well adjusted and made good progress.

The third thing one can do is bring pressure to bear on the group itself. You cannot bring pressure to bear on one member and control the activity of the group unless that one member is the real ringleader. If you have the one who sets the pace (I am not talking about style) and can control that one, frequently you can control the group. Your chil-

drén and my children and the ones we come in contact with may not be the real ringleaders.

Many of you have been through this, I guess. If you haven't and have children, you will. I shall tell you a personal experience. In our city, girls begin having dates alone when they are about 14 or 15. Up until that time they go with someone's parents in a car to a party and then are brought home, but at about 14 or 15 years of age a boy comes and gets the girl in his father's car, takes her to a party and brings her home. Along about 7:30 on Friday evening, usually, your daughter gets all dressed up and she is pretty as a picture. She comes downstairs and is ready to go. You say to her, "Now, sister, I want you to have a good time, but I want you home by 10:30." That is logical, isn't it? Now here comes the herd instinct right down the middle of the hall floor like a herd of elephants. She says, "Well, I might as well not go," and shrugs her shoulders. "I'll be a wet blanket if I go." You want her to go and be acceptable, and yet you want her home by 10:30 and there is a conflict.

What are you going to do? You are going to do just as I did, get cowardly and back out, and you are going to say the same thing, perhaps. You are going to let her go, and your final words will always be, "Well, go ahead, sister, and be a good girl."

Then she goes. I live about a block from a boulevard out which the ambulances come to our populous society group in Dallas, Highland Park. Along about 10:30 the first ambulance comes, and you wonder if it is going to pick her up. You appear to be reading, but you don't know what you are reading, and the same applies to your wife. In 20 minutes another ambulance comes out, and you wonder if that one is going to pick her up. You appear to be reading; you don't pull your hair and walk the floor and scream, but just act kind of numb and dumb. In about 20 minutes another ambulance comes out. I have timed them, and that's the way they come in our city. Finally, along about 11:30 or 12 o'clock she comes home and you breathe a sigh of relief for one week, because the same thing happens again next Friday night.

Are you going to control it? Do you know that every other parent or group of parents in that gang met the same thing along about 7:30 and all got defeated? There are usually only about 6 to 12 girls in this group. Call the parents and have a club meeting. Ask them, "Wouldn't you like to have your daughter home by 10:30 or 11 o'clock?" Mrs. Smith and Mrs. Jones and every one of them will say yes. "All right, you tell your daughter and you tell yours and I'll tell mine." Then when she comes down at 7:30 and you say she must be home by 10:30 or 11:00, she can't shrug her shoulders and get away with it, because the party will be over at that time. This isn't new; it's as old as the hills, and yet it works.

I made a speech about this one time to a junior high school P.T.A., and when I came back the next year to make another talk to them I got more testimonials to the effectiveness of this than Lydia E. Pinkham has. It works if you will just carry it through. It is important that we recognize the pressures and influence of the gang and strive within reason to keep it acceptable.

The fourth and last point I want to make is, I think, most important. Why do we do good things? Why are we good citizens? Why do we fit into our group and our community and our civic organizations? Because of that four letter word you hear on the radio and television a great deal. It is "love." It is the greatest dynamo in this world and is the reason we usually do good things. If you will infiltrate, percolate, saturate love in the family between parent and child, in the family group, into children, you usually will have no trouble. You are here this very moment because you love; if you didn't, you would be somewhere else. Everything you and I have done has been because of love of something—prestige, honor, money, church, state, people, causes, hobbies; we do things because we love, and we usually do good things.

Some time read the thirteenth chapter of First Corinthians. It won't hurt doctors to read that Book. "Love suffereth long, and is kind . . . doth not behave itself unseemly . . . is not easily provoked; thinketh no evil; doeth no evil."

Love builds people up. Our grandparents

never read child guidance books, yet if they loved their children they usually had a pretty good family; if they did not, frequently there was trouble.

How long does it last? It lasts forever. Let me ask you a rather foolish question. Do you still love your mother? Of course you do; it never ceases. If you can infiltrate this into a family, it lasts and lasts and lasts.

You may say, "Dr. Young, why talk about it? We all love our children." Let me tell you a true story. About eight years ago I met a little boy about 10 years of age, built like a blackjack stump, a rugged individual. When he shook hands it was not a dead fishtail handshake; he looked you in the eye. When I met him I said to myself, "This boy is going to be something some day; he is going to make a man of himself." He was the meanest boy in the neighborhood; he was a hellion. He had been before the juvenile authorities twice at the age of 10. I talked to him, and it is surprising what you can learn if you will talk to children and get their confidence. After about 10 or 15 minutes he said, "Dr. Young, if I could get three meals a day I would run away from home." I asked, "Why?" He said, "No one loves me at my house." I believe anybody could have salvaged him at that time. I made a mistake. The next day I told his mother what he had told me. She took him home and broke a bed slat on him for telling me so. I checked on the boy in the summer of 1957. He was in the state reformatory for boys for the second time.

Love works wonders if you try. It lasts forever; it makes for happiness. Every woman in this audience is happy if she has a husband and he loves her; she is unhappy if he does not. It can't be purchased. Cars and minks and diamonds will not purchase it. It must be real and must be there. It lasts forever.

There is nothing so hollow in this world as just spoken love. If you just speak about it alone it is hollow and rattling, but if you live it and speak it, it is wonderful. Every woman everywhere is happy if her husband loves her. Let me tell you she is extremely happy if he tells her so. And let me tell you girls a secret: Your husband feels the same way.

Sit down with a child some time during the day and tell him you love him. At what age? Any age, from the time he can understand the English language until he leaves you and goes away. And when he comes back home with his family, tell it to him again. A wife 75 years of age gets just as much kick out of it, just as much thrill out of it, as she did when she was 22. Sit down with them, use your own words, but get it across to them if you can. I don't mean a choking, suffocating, cloying type of love. I don't mean the kind that doesn't let you be an individual. I don't mean the kind that keeps a child tied to his mother's apron-strings. I know some 16 and 18 year old boys whose umbilical cords haven't been severed yet as far as their emotional life is concerned. They are guided, they are ruled, they are lived for by their mothers; they're mom's boys. Let them live their lives, let them live independently; give them all the freedom you can—they get along with freedom. You don't solve adolescent problems in adolescence; you solve them as you come up toward adolescence. All the freedom they can tolerate is what children should have as they come along. Sit down with them, say, along about bedtime on the couch or the bed—at any age—and tell them, "I love you with all my heart. I sure am glad I've got you. I wouldn't swap you for all the boys and girls in the neighborhood. I wouldn't part with you for 50 million dollars. I'm glad I've got you. We're going to stick together through thick and thin. I love you." That child's chest will come out 2 in. and he will do almost anything for you. But you have got to live it.

Why do I talk about it? Those who think of the emotional development of children in America—the pediatricians and everyone else—are very much concerned about the family life of America. We feel it is necessary that we get again the family life, the liaison between parents and children that is healthy and happy. Remember, it lasts forever.

Congenital Atresia of the Rectum and Its Complications

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Operation for congenital atresia of the rectum with rectovaginal fistula should be delayed until the child is at least six months old, and the median raphe should be kept intact. A child who has had operation for rectal atresia, especially a boy, should not be dismissed from the surgeon's care too early. The danger of fecal impaction postoperatively is often forgotten.

CONGENITAL atresia of the rectum is one of the most difficult anomalies of infancy. The surgeon who performs the first operation on a child with this defect is the one who decides the youngster's future; and a tremendous task he has, for the sphincter will be used by the patient for a lifetime, approximately 70 years.

WILLIS J. POTTS

At our hospital we see mostly the difficult cases of rectal atresia and associated complications. Rarely do we see the ones in which there is merely a membranous occlusion—a tiny bit of membrane over the rectum. In one such case the infant was admitted to the hospital with the proper diagnosis of atresia of the rectum, and the nurse, according to the custom of the hospital, took a rectal temperature reading and cured the child. To add insult to injury, the pediatrician then took over and did some dilatations.

When a male infant with atresia of the rectum is brought to the hospital, we gather the residents about. It is obvious that the child has rectal atresia, so we ask, "What do you want to know next?" Invariably the answers are "an x-ray of the baby in the upside-down position to see how far the gas has traveled toward the rectum" and "a general physical examination to see if there are other congenital anomalies." These answers are correct but fail to mention the most important point (and we persist until we force it out of them), name-

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ly, whether or not there is a communication between the bowel and the urinary tract. Next question: "How are you going to find out?" Usually the residents want to put in a catheter, when all they need do is look at the urine and observe the sediment, or, frequently, inspect the diaper for flecks of meconium where the infant has urinated. Only if there is a question of a recto-urethral fistula is a catheter needed; when inserted, it may slide up into the bowel or it may go into the bladder and evacuate perfectly clear urine. If an x-ray taken after about 24 to 36 hours shows air 2 in. from the marker on the skin, you may be sure there is a rectal communication with the urinary tract.

Operation for Congenital Atresia of the Rectum

The deformities we routinely see in association with rectal atresia are rectovesical or recto-urethral fistula in the male infant and rectovaginal or rectoperineal fistula in the female infant. Occasionally we see a male infant with a low-lying rectum and a perineal fistula coming out somewhere along the base of the scrotum.

Let us consider first the male child with congenital atresia of the rectum and a rectovesical fistula. The drawings in figure 1 illustrate the operative procedure. This defect, we believe, requires an abdominoperineal approach, so the baby is put on the table and the entire abdomen and the inner part of the thighs are prepared. Notice the venous cutdown in the ankle, which is essential for administration of blood and fluid. Sandbags and adhesive tape hold the legs in position. Before the child is put to sleep, one may demonstrate the position of the sphincter by snapping the rectum; the position is not marked with a pencil but is scratched with a pin so that one may know where to spread the fibers of the sphincter muscle.

An incision is made in the median raphe. It should be noted here that operation is never performed on any child with rectal atresia without a catheter in the bladder. The abdomen is opened, and the distended colon is collapsed by drawing out the air and then clamped across with a coarctation forceps. The bladder is drawn forward, and the rectum is drawn backward until the fistula comes in view. It is sutured with a number of interrupted sutures put in one at a time so that the bladder does not creep away and allow the fistula to go out of sight.

If there is a recto-urethral fistula, it almost always will be found just distal to the prostate. A perineal approach as well as an abdominal approach is often required in such cases.

The end of the bowel is caught with some sutures and drawn through the sphincter, where it is sutured in place, as shown in figure 1 (H, I and J).

Now let us consider congenital atresia of the rectum with rectovaginal fistula. In an article a few years ago we advised operating on these children during the neonatal period. That was wrong. Operation should be delayed until the child is six or seven months old (not later than nine months). The reason for delay is that the rectum will hypertrophy during these six months and at operation the wall will be more easily distinguishable and dissectible, so to speak, from the surrounding structures. During this six month period the infant will move her bowels through the fistula if given food that keeps the stools pasty. The mother is instructed that under no circumstances shall the child be allowed to go more than 24 hours without a bowel movement.

The operative procedure for repair of a rectovaginal fistula is shown in figure 2. Figure 2A illustrates the position of the child on the table, a catheter in place in the bladder, and the venous cutdown essential for administration of blood and fluid. An incision is made first to identify and spread the muscle fibers of the rectal sphincter, and then a second incision is made below the vagina. Formerly we used a Y incision, but that is unsatisfactory because the area of skin over the perineum is extremely important in the healing process. Now comes the important part of the procedure. Through the curved incision one dissects out the rectum and carefully preserves the perineal body or the median raphe. This addition that we have made to the operation we believe is a very important step. The median raphe is not cut, because the sphincter is at-

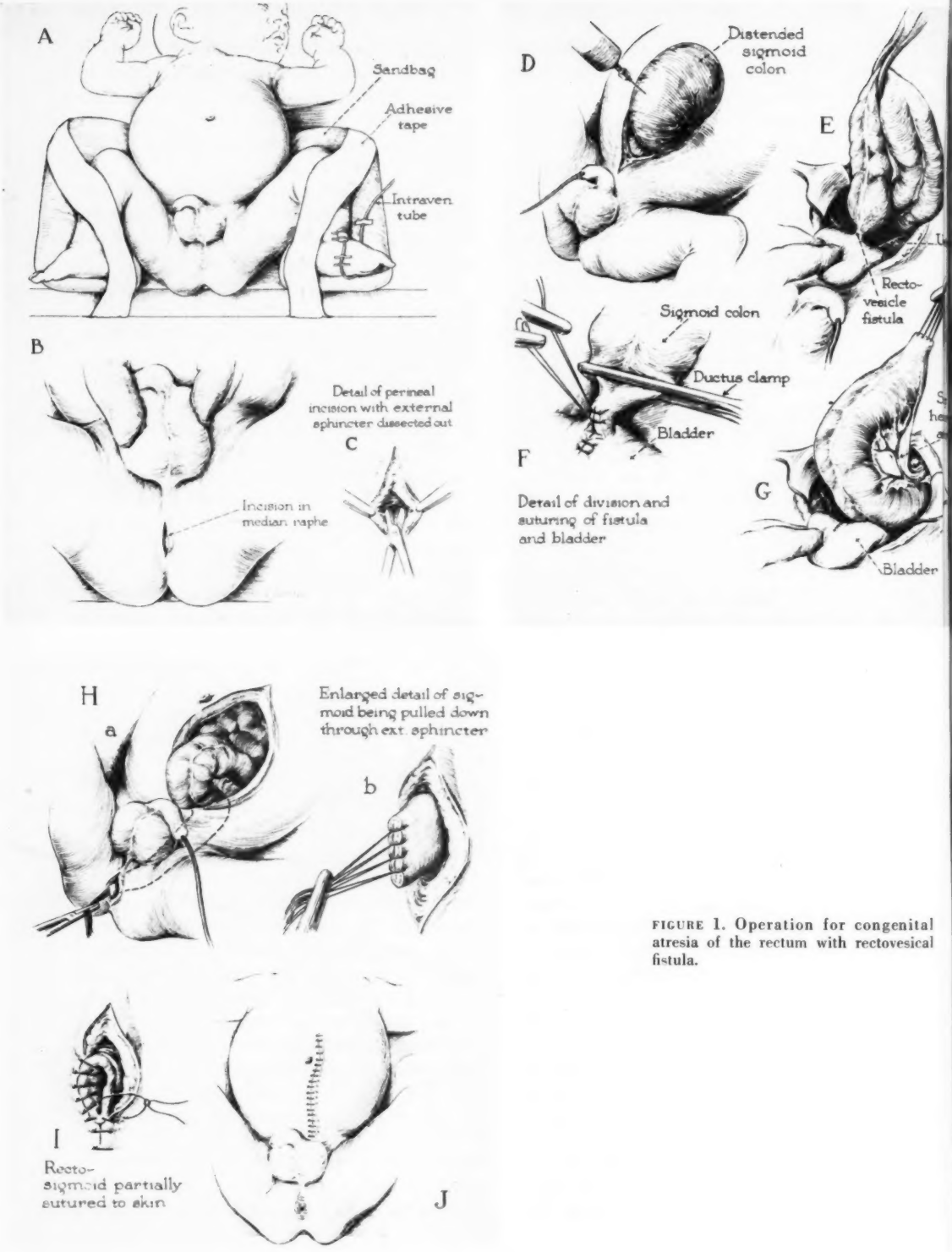

FIGURE 1. Operation for congenital atresia of the rectum with rectovesical fistula.

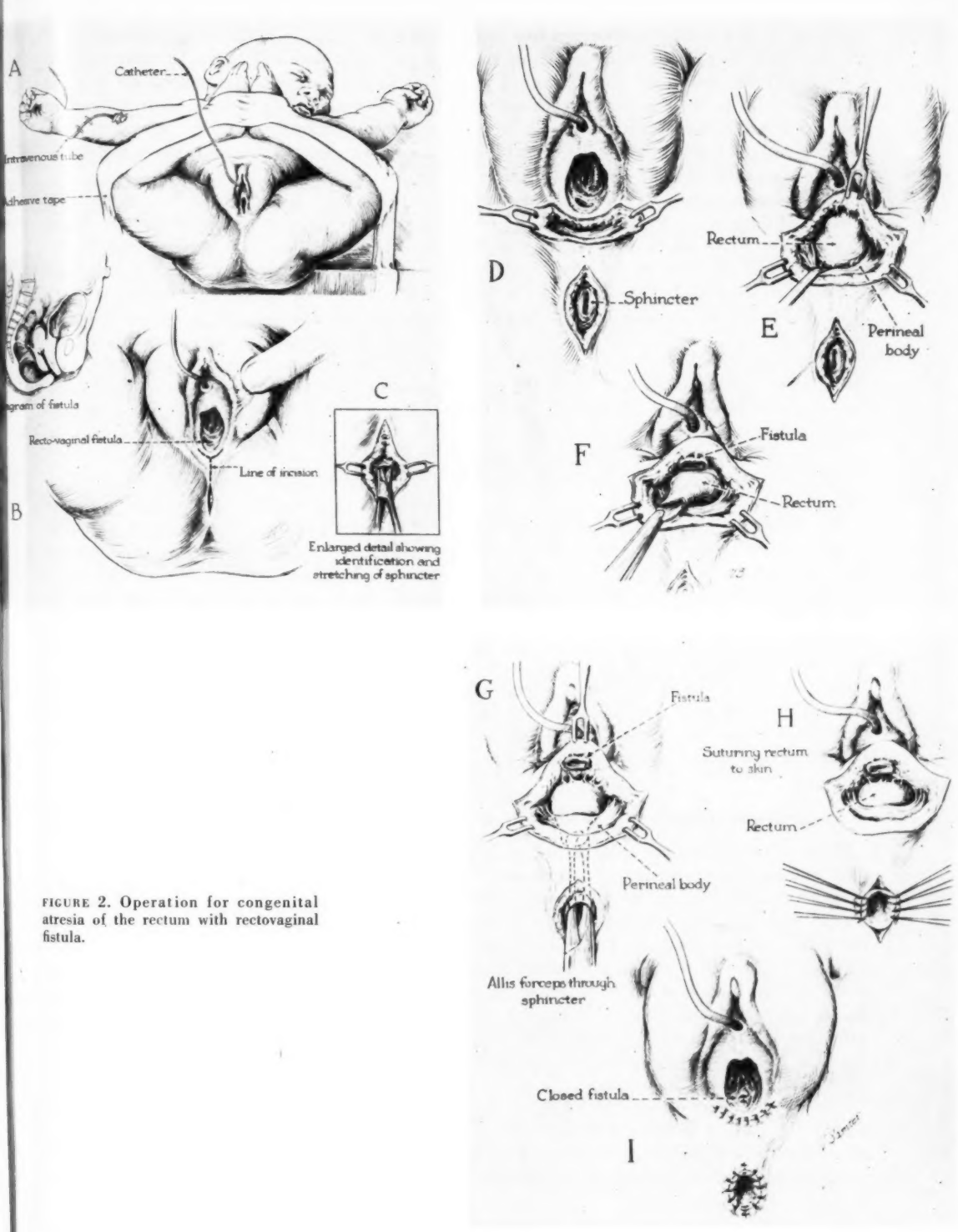

FIGURE 2. Operation for congenital atresia of the rectum with rectovaginal fistula.

tached to it. The rectum is dissected free posteriorly from the median raphe and from the vagina, and this dissection anteriorly must go all the way up to the peritoneal reflection so that the bowel when drawn down will lie in position without tension (figure 2D, E and F). Most of the problems that arise result from insufficient freeing of the bowel, leaving some tension. If there is tension the bowel will give way and move upward. In between the end of the bowel and the skin an iron-clad stricture will form which nobody can dilate. The bowel is sutured to the skin and the operation is complete (figure 2I).

Some youngsters have atresia of the rectum and a fistula going all the way along the bottom of the scrotum. This is relatively easy to repair because the rectum comes down low and can easily be sutured, skin to rectum, without tension by a perineal approach. Excellent results are obtained.

We see a fair number of children with a "split rectum." There is a band across the orifice. At operation it is wise to leave more tissue than seems necessary. The tendency to excise this band completely should be overcome. One should cut across it and then sort of dissect the cut ends and suture each end separately. The result at the time of operation will not look too good, but when you see the child after a year there will be plenty of distensibility and little visible deformity of the rectum.

Postoperative Care

After the operation the child is put on his back and his legs are strung up with a couple of strips of adhesive, just as one would do in a child with a fracture of the femur in Buck's extension. In this position, as the baby urinates and moves his bowels the material runs down on the diaper under him rather than into a soggy, occlusive diaper which promotes softening of the skin and interferes with healing. The nurse can irrigate rather than wipe off the material from the perineum.

The baby is kept in bed for 10 days, and during this period is given a teaspoonful of mineral oil every night. After that, he will never get mineral oil, because it tends to run right through the child whose sphincter still is not right and will cause horrible excoriation of the buttocks. The mineral oil is given only after operation to keep the stool soft so that in the immediate postoperative period an impaction cannot form and injure the suture line of the incision.

On the tenth postoperative day, gentle dilatations are begun with a centrifuge tube. When the child goes home the mother receives instructions to dilate the rectum. The reason we insist on operation when these babies are very young is that dilatation of the rectum is an extremely painful process and we wish to complete the dilatations before the memory of pain comes into the picture. To dilate the rectum of a four year old child requires four people to hold the child, and the screaming can be heard in the next block.

The mother dilates the child's rectum with a finger cot on her little finger, pushing it over the first joint. After she can insert her little finger easily, she uses her first finger until she can get it over the first joint. If her fingers are small, she is instructed to use her middle finger. Sometimes we bring the father into this dilating process; it is good training for him. Dilatation is done every day or every other day until in the course of a couple of months the rectum is properly open. At this point the child is often dismissed from the surgeon's care, and this is when the trouble begins; a child with atresia of the rectum, especially a boy, should not be dismissed from the surgeon's care until he is six or eight years old and knows the problem himself.

As I see these patients who have had operations for rectal atresia performed by excellent surgeons I am impressed that one important thing has been forgotten—the danger of fecal impactions. When these children get impactions, diarrhea develops. The parents think the bowels are moving fine, but the buttocks are excoriated and the child is constantly straining and soiling his diaper. Why do these impactions occur? It is important to sit down with the mother and explain in very simple terms that the child does not have the last important part of the bowel; that in a bowel movement the material comes into the rectum,

the message goes to the head that material is entering the rectum, and the message goes back to the rectum to "close the gate"; the child's distal portion of the bowel is missing, and so he does not have that sensation and therefore is apt to get an impaction. We insist that the child's bowels move some formed material every day; if they do not, an enema must be given. Many enemas will be required from time to time. Whenever a child who has had an operation for atresia of the rectum is brought in and the mother says, "My boy is soiling his pants all the time even though his bowels are moving five and six times a day," it is a foregone conclusion that the rectum is filled with a big hard mass. We have had to hospitalize some of these children for 10 days and use a Bradford frame with irrigations every four hours to wash out the impaction.

In rectal atresia with rectovaginal fistula, if the median raphe is kept intact when the defect is repaired the girl will have a good sphincter and will not have too much difficulty after operation. Dilatations will be required, but at about the age of two years she can be toilet-trained, whereas the boy cannot be toilet-trained at two years of age or even at three. Those youngsters who have had a large part of the lower bowel missing do not have nerve supply and consequently have to learn to use the buttocks, levators and external sphincter.

The process of training is begun with adult-sized suppositories and with small enemas. The child is kept on a constipating diet—not constipating enough to block but enough so that the stools are formed. If the stools are hard and dry, a little accident once in a while is not too distressing. Passage of formed stools helps to educate the rectum.

Through this process for two, three, four or even six years, the child will slowly learn to develop some semblance of control. By the time he goes to school he will have fair control. I am sorry that this picture is painted too brightly in the books; it just is not so. It takes five or six years of patience with the child and with the parents to get the rectum working properly, and the reward is that eventually the boy will have good control—not as good as normal control (and you tell the parents that), but he will get along fairly well. He can live happily, and the only time he will have trouble is when he has diarrhea.

Indications for Colostomy

Once in a while one sees a child with grossly deformed buttocks and no possible place to fashion a rectum, and has to tell the parents, "I am sorry, I can do nothing for your child except a colostomy." They ask if he will have it all his life, and the answer is, unfortunately, yes. If there is a hopeless deformity of the buttocks there is no choice but to do a colostomy and remove the distal portion of the bowel to avoid a "cesspool." The end is blind, and even if there is no attachment to the bladder there eventually will be trouble. We do not perform colostomy for congenital atresia of the rectum or imperforate anus except when there are multiple deformities. A child with a tracheo-esophageal fistula, for instance, may also have an imperforate anus. If the child's condition is such that he cannot tolerate the definitive operation the first couple of days of life, and such instances are rare, only then do we do a colostomy. The colostomy must be done short of the splenic flexure. If it is done in the recto-sigmoid, the later operation becomes almost impossible because the short segment cannot be mobilized sufficiently to be brought out at the rectum. If one must do a colostomy, it should be high.

Comment

This has been a rather rambling presentation about atresia of the rectum. A fraction of 1 per cent of children are born with this deformity, and you and I do not realize how important our sphincters are because we have them and have never been without them. If the unfortunate baby so afflicted could look up at you and speak, I am sure he would say most pleadingly, "Please be careful of that sphincter. I am going to use it for the next 70 years."

Ophthalmoscopy is a useful tool for the practitioner. Retinal changes may occur in systemic diseases other than diabetes mellitus and hypertension. In some unusual conditions coordination of systemic findings with evaluation of changes in the fundus oculi can be valuable in diagnosis, therapy and prognosis.

Retinal Manifestations of Systemic Diseases

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RETINAL changes associated with diabetes mellitus and hypertension are discussed frequently in the literature. The purpose of this paper is to call attention to some other systemic illnesses, diverse in nature, whose total pictures may include changes in the fundus oculi. Among those to be discussed are blood dyscrasias, connective tissue diseases, cranial arteritis, pulseless disease, intracranial and metastatic tumors, pseudoxanthoma elasticum, and the Vogt-Koyanagi syndrome.

Blood Dyscrasias

Anemias—Retinal changes associated with the anemias are not characteristic, except those in sickle cell anemia, which I shall discuss separately. Fundal lesions are common in the anemias and occur eventually in any advanced or inadequately treated case. They may become apparent when the hemoglobin level drops approximately 25 per cent, and they can aid in evaluating therapy. The general coloration of the fundus depends on the concentration of hemoglobin in the choroidal circulation, and hence the pallor is proportional to the severity of the anemia. As the retinal arterioles and veins gradually dilate, they approximate each other in size and color.

Intraretinal hemorrhages commonly occur as the result of diapedesis from the arterial capillaries in the nerve fiber layers. Their appearance depends on the depth and extent of bleeding, severity of the anemia, and length of the clotting time. If bleeding is superficial the hemorrhages are pale and flame-shaped or linear, while deeper hemorrhages usually are irregularly rounded, variable in size, and darker in color. One may also see round or elongated hemorrhages with white centers, representing accumulations of leukocytes, but they are more common in the leukemias.

Extraretinal hemorrhages occur somewhat less frequently. They may be preretinal (subhyaloid) in location or may break into the vitreous. Preretinal hemorrhages vary greatly

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in size, shape, thickness and location. In the macular area they may exhibit a "fluid level" when the patient is erect. Vitreous hemorrhages are relatively uncommon and clear slowly, causing disturbing vitreous floaters.

Extravascular transudation of fluid produces diffuse retinal edema that gives the fundus a homogeneous gray color. Absorption of the fluid may be delayed or only partial, resulting in so-called hard exudates, small and yellow-white with sharp borders. These usually appear in the posterior pole, and in the macular area they produce the picture of a star figure. They eventually absorb. Rarely a serous retinal detachment is seen which is self-limited and may leave a pigmented line of demarcation.

Sickle cell anemia—Cases have been reported in which retinal and vitreous hemorrhages have been associated with sickle cell disease. By means of paper electrophoresis one can distinguish between the homozygous and heterozygous sickle cell states. In the homozygous state, symbolically represented as S-S hemoglobin and synonymous with true sickle cell anemia, the hemoglobin is almost entirely of the sickle cell type, with a small amount of fetal hemoglobin. In the heterozygous state, sickle cell hemoglobin coexists with normal hemoglobin (A) or other abnormal hemoglobin (C, D, E, and so on), and the condition is represented by the symbols S-A, S-C, S-D, S-E, and so on.

Kennedy and Cope[1] stressed the relationship between sickle cell hemoglobin-C disease and recurrent vitreous hemorrhages and hemorrhages about the retinal veins (Eales's disease) and suggested the interesting possibility of a causal connection. Patients with sickle cell hemoglobin-C disease may have mild hemolytic anemia with or without icterus, hemolytic crises, reticulocytosis, musculoskeletal complaints and hepatomegaly. Almost constant features are circulating target cells and splenomegaly. The fundal picture is one of periphlebitis characterized by venous sheathing, recurrent vitreous hemorrhages, and, eventually, glial bands, retinal detachment and blindness.

Purpura—The retinal change characteristic of the purpuras is retinal hemorrhage, varying in thickness, size and contour. It rarely exceeds the diameter of the disk in size and may be situated in any retinal layer or preretinally.

Leukemias—Fundal findings in this group of conditions are similar regardless of the type of leukemia. Ocular changes may consist of edema of the lids, ecchymosis, subconjunctival hemorrhages, proptosis from hypertrophy of the accessory lacrimal glands, and petechial hemorrhages in the conjunctiva. The findings in leukemic retinopathy are almost pathognomonic for this group of diseases. Time of onset varies from as early as three weeks after the start of the disease for acute forms to as late as 10 to 15 years in chronic forms, and the retinal changes are therefore not of prognostic significance. They occur in approximately two-thirds of the cases, with a slightly higher incidence in acute forms than in chronic forms, and are twice as common in myelocytic leukemia as in lymphatic leukemia.

Ophthalmoscopic findings consist of vascular engorgement, especially on the venous side, and hemorrhages similar to those seen in the anemias. Retinal hemorrhages are more common in myelocytic leukemia than are hemorrhages in the skin, mucous membrane or subcutaneous tissue, while the reverse is true in lymphatic leukemia. Edema exudates and cotton-wool patches also are seen. The retinal changes in chronic myelocytic leukemia are the result of the combination of anemia and the high leukocyte count. Leukocytic infiltration of the retina and choroid leads to sheathing and paralleling of the veins by a grayish-white transudate. These findings are limited almost solely to the chronic myelocytic type.

In general, the retina in leukemia is whitish-gray in color, and it may become pale green or light orange, depending on general retinal pigmentation and the degree of leukocytic infiltration of the choroid and retina. The retina appears thickened, and there will be edema of the disk and approximation in color of the veins and arterioles, especially as vascular engorgement progresses.

Polycythemia[2]—In this condition the fundus is congested and often cyanotic in ap-

pearance. Retinal veins are dark, dilated and tortuous. Arterioles usually are of normal size early in the disease and much darker than usual. There is an increase in the light reflex, and as the condition progresses the retinal arterioles may dilate. The degree of darkness or cyanosis of the retina depends on the extent of general cyanosis. There may be scattered hemorrhages and retinal edema. The disk usually is deep red with a prominent cup. Occasionally, papilledema is seen due to the congestion; later in the condition optic atrophy or retinal arteriospasm may be found.

In general the visual disturbances in the blood dyscrasias depend on involvement of the macula or other retinal areas by edema, hemorrhages or exudates. There may also be damage to the visual pathway, however, either because of death of cells or as a result of hemorrhage into the pathway.

Connective Tissue Diseases

Klemperer coined the term collagen disease to stress the connective tissue reaction in an apparently related group of conditions.[3] However, the term connective tissue disease is now preferred. Fibrinoid degeneration seems to be the common denominator for these disorders. In 1880 Newman postulated that this degeneration was due to transformation of collagen fibers into a fibrinlike material. Altshuler and Angevine expressed the belief that the site was the homogeneous ground substance and the fibrinoid deposits were the result of precipitation of mucopolysaccharides by the action of a basic protein.

The role of hypersensitivity in the connective tissue diseases probably has been overemphasized. Klinge produced fibrinoid changes in the connective tissues of rabbits made hypersensitive to foreign proteins. This change is also seen, however, in peptic ulcer, pancreatic necrosis, acute bacterial infections, and animals made hypertensive by the Goldblatt mechanism and by repeated injections of ADRENALIN®. Many of the illnesses comprising the connective tissue diseases are related to hypersensitivity, but it is not found in all of them. The connective tissue diseases consist of disseminated lupus erythematosus, polyarteritis (periarteritis nodosa), dermatomyositis, scleroderma, serum sickness, rheumatic fever and rheumatoid arthritis.

Involvement of the retina, choroid and optic nerve is most frequent in lupus erythematosus, occurring in approximately 25 per cent of cases, but it is also seen quite often in polyarteritis, dermatomyositis and serum sickness. The characteristic changes are cotton-wool patches, flame hemorrhages, papilledema and choroidal infiltration with leukocytes and transudates. Early in the disease one may see cotton-wool patches (the result of ischemic infarcts), a few flame-shaped hemorrhages, and, occasionally, slight papilledema. Retinal vessels usually appear normal. These lesions occur during an exacerbation of the general disease and may disappear as the systemic condition improves. Later, when hypertension develops, vascular lesions appear in the form of arteriolar narrowing, either localized or generalized, and arteriovenous-crossing changes.

These retinal changes are not limited to connective tissue diseases. However, the combination of cytoid bodies or cotton-wool patches in an otherwise normal fundus and a prolonged low grade fever, arthritis, leukopenia, or cardiac or renal involvement might lead one to suspect the presence of a connective tissue disease. Fundal changes also may aid in differential diagnosis of rheumatic fever, rheumatoid arthritis and disseminated lupus erythematosus, which may be difficult to distinguish in the early stage; fundal changes are not seen in rheumatoid arthritis or in rheumatic fever.

Other ocular changes may be associated with the connective tissue diseases. Examples are nongranulomatous iritis in rheumatoid spondylitis, polyarteritis or dermatomyositis; retinal perivasculitis or occlusion of the central retinal artery in polyarteritis; episcleritis and nodular scleritis in polyarteritis, rheumatoid arthritis or dermatomyositis; and scleromalacia, sclerokeratitis and Mooren's marginal ulcer in polyarteritis or rheumatoid arthritis.

Cranial Arteritis[4]

Cranial arteritis can involve any of the cranial arteries and even arteries elsewhere.

It usually is seen in persons more than 55 years of age, predominantly in women. It is characterized by painful, tender, cordlike arteries. Headache may be so severe that the patient cannot rest his head on a pillow. Usually the temperature and sedimentation rate are elevated and there are signs of wasting and depression. Involvement of occipital and ophthalmic arteries may ensue several months after involvement of the temporal artery. Extension to the ophthalmic artery or its branches leads to marked visual loss, often bilateral, and permanent complete or partial blindness. Complete recovery is rare. Fundal changes may be absent or may resemble ischemic retrobulbar neuritis. There may be occlusion or spasm of the retinal artery, or optic neuritis with papilledema. Pathologically one sees a picture of necrotizing arteritis. The course is prolonged but there is a good prognosis for life. Visual impairment, when it occurs, is usually permanent. It has been postulated that cranial arteritis is related to polyarteritis or is a form thereof.

Pulseless Disease or Takayasu's Syndrome[5]

In this condition, first described by Takayasu in 1908, arterial pulsations are absent in the upper extremities and carotid arteries. There are evidences of arteriovenous aneurysms and there may be recurrent syncopal attacks as the result of a hypersensitive carotid sinus. Occasionally the presenting complaint is visual disturbance. Ocular changes consist of cataracts, either of the nuclear or of the complicated type. Early fundal changes are microaneurysms and beadlike swellings of the veins. Later, large arteriovenous aneurysms appear near and encircling the head of the optic nerve, and very late one may find optic atrophy and atrophy of the peripheral retina.

Onset usually is gradual with occlusion of the aortic arch, innominate artery, left common carotid artery and left subclavian artery. The patient will complain of recurrent transient blurring of vision, especially on assuming the upright position. An ophthalmoscopic examination shows changes in the blood supply with clumping of individual red cells in the venous side of the circulation. Attacks of dizziness and unconsciousness occur due to increased sensitivity of the carotid sinus and impaired cerebral blood flow. The cause of the condition is unknown but it has been variously ascribed to syphilitic aortitis, arteriosclerosis or spontaneous arteritis and thrombosis involving the adventitia and media of the artery. It has also been postulated that it is related to Buerger's disease, allergy, panarteritis of unknown causation, or a collagen disease.

Intracranial and Metastatic Tumors

Intracranial tumors may produce visual field defects by involving the extraocular muscles or visual pathways. Fundal changes that may be associated consist of papilledema and optic atrophy. The Kennedy syndrome, usually seen as a result of a frontal lobe tumor, particularly a meningioma of the olfactory groove, consists of optic atrophy on the involved side and papilledema on the opposite side due to increased intracranial pressure.

Tumors may metastasize by way of the blood stream to the choroid and be visible ophthalmoscopically. These metastases often are overlooked because of the serious nature of the general illness. They occur mainly in the posterior pole, primarily involving the choroid, and are more frequent on the left side. Sixty-five per cent of these tumors arise in the female breast, 10 per cent originate in the lung, and 10 per cent have their origin in the alimentary tract. The remainder metastasize from the thyroid and liver and, rarely, the parotid and prostate. The retinal changes are those of a flat retinal detachment, usually in the posterior pole. It is pale and mottled gray in appearance, and it usually is poorly circumscribed.

Subarachnoid Hemorrhage

Subarachnoid hemorrhage usually is due to rupture of an intracranial aneurysm but may result from bleeding from a tumor, especially an angioma, or the breakthrough of an intracerebral hemorrhage. Other causes are rupture of an atheromatous artery, blood dyscra-

sias and trauma. The onset usually is abrupt with severe headache and stiff neck. Unconsciousness and death may follow in a few minutes or several days. Usually, however, there is transient unconsciousness and confusion. Often there is papilledema of varying degree, and retinal hemorrhages near the disk are common. The most typical finding, but not as common, is a large subhyaloid hemorrhage scattered about the nerve head. Visual disturbances are produced by hemorrhages into the nerve sheaths, or chiasms with field defects and optic atrophy. Visual impairment also may be the result of subhyaloid hemorrhages covering the sensory elements of the retina.

Pseudoxanthoma Elasticum

Pseudoxanthoma elasticum or Grönblad-Strandberg syndrome is characterized by degeneration of elastic tissue and cream-colored striae of the neck, axillae, breasts, elbows and knees. Degenerative changes also occur in the elastic lamina of the arterial blood vessels, so that the patient may have symptoms of intermittent vascular insufficiency of the extremities. There may also be ruptures of Bruch's membrane in the fundus with a resulting picture of angioid streaks and coexistent macular degeneration.

Vogt-Koyanagi and Harada Syndromes

The cause of this group of conditions is unknown but the syndrome has been variously ascribed to viruses, pigment sensitivity or tuberculosis. It has a predilection for persons of Oriental extraction. Findings consist of those attributable to meningeal irritation, and there also may be poliosis, vitiligo, auditory disturbances, uveitis and retinal detachment. Systemic recovery usually is complete, and useful vision often returns.

Conclusion

Changes in the fundus oculi, when properly evaluated and coordinated with systemic findings, can be of value in diagnosis, therapy and prognosis. The diseases discussed are by no means the only ones with retinal manifestations, but they do represent a group of interesting and unusual conditions in which ophthalmoscopy adds an additional tool to the armamentarium of the practitioner.

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Medical and Surgical Problems in Liver Disease

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Treatment of hepatitis consists principally of bed rest and a high calorie, high protein diet with added vitamins; in relapsing hepatitis, corticosteroids also may help.

Emergency treatment, necessary for patients with hemorrhage from esophageal varices, includes blood transfusions, tamponade to control bleeding, and removal of blood to prevent hepatic encephalopathy. Surgical procedures include splenorenal and portacaval shunting operations, esophagogastrectomy, and hepatic and splenic arterial ligations; the latter are still in an experimental stage. Percutaneous splenic portography is of value in selecting the type of shunting procedure.

In hepatic cirrhosis the prothrombin level has prognostic significance.

Often the only way to differentiate primary biliary cirrhosis and the extrahepatic variety is by liver biopsy.

DR. RICHARD W. VILTER: Dr. Altemeier and I wish to talk about certain areas in the field of liver disease where surgeon and physician can best cooperate for the good of the patient. We shall try to cover some aspects of the inflammatory types of liver disease and the degenerative results of such inflammation, and then speak a bit about obstructive factors involving the liver.

Hepatitis

Hepatitis is the culprit behind the great majority of the diseases of the liver we shall discuss later. Figure 1 is an illustration of infectious hepatitis. One can see the round cell infiltration, the swollen and degenerating liver cells with reduplicated nuclei and some of the balloon cells, which are indicative of infectious hepatitis.

Although 98 per cent of patients with infectious hepatitis will improve spontaneously, still it is wise to institute bed rest and give a high calorie, high protein diet (approximately 120 gm. protein) and added vitamins. It is important to recognize and treat subclinical hepatitis

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characterized by anorexia, fever and liver tenderness but no jaundice. The great majority of patients recover, but a few go on to acute yellow atrophy (acute hepatic necrosis). Usually this happens within the first several weeks, and if one sees it occurring in patients with infectious hepatitis it is possible that corticosteroids may protect the liver cells from degeneration while the body defenses mobilize to take care of the virus. This is the group, small in terms of total cases of hepatitis, which causes trouble later on.

Subacute hepatitis may be clinical or subclinical. Exacerbations may occur over a period of months or years or the condition may remain subclinical for a long period. In either instance, however, it may eventuate in postnecrotic cirrhosis, portal hypertension, bleeding esophageal varices, liver cell failure, and, ultimately, death.

The posthepatitis syndrome probably is a form of neurosis found in patients after an attack of hepatitis or the type of symptom complex one finds in neurasthenic patients after any viral disease. Symptoms continue even after the tissues have healed.

During the period when hepatitis is flaring up and subsiding (subacute or relapsing hepatitis), corticosteroids also may be of some benefit; at least they may help protect the liver during exacerbations of the acute inflammatory process. By and large, however, we rely for our treatment of hepatitis on diet, bed rest and vitamins. It is wise to keep the patient at rest until the serum bilirubin level is less than 1.5 mg. per 100 ml. and the BROMSULPHALEIN® retention is less than 10 per cent in 45 minutes. If, after physical activity is resumed, the liver becomes tender or either of these levels rises, the patient should be put back at rest until they subside again and another trial of activity can be instituted. In some of these patients it is the physical exercise which favors continued activity of the infection, and when this happens subacute necrosis may eventuate.

Dr. Altemeier, how can the surgeon help the internist or general practitioner in the management of hepatitis?

DR. WILLIAM A. ALTEMEIER: We do not recommend any form of surgical treatment for acute hepatitis. In fact we carefully avoid operative procedures on patients with active viral hepatitis. I should like to point out, however, that some French surgeons treat patients with this disease electively by periarterial sympathectomy of the hepatic artery.

Bacterial or Fungal Inflammation of the Liver

Infecting microorganisms can be brought to the liver by various ways. They may be carried by the portal vein from inflammatory processes in the appendix, rectum, colon or other areas of the gastrointestinal tract. They may spread to the liver from the gallbladder or the subphrenic space. In unusual circumstances infection may be introduced in the liver by trauma, such as penetrating wounds of the abdomen involving the liver or, occasionally, nonpenetrating injuries. Most cases, however, are the result of hematogenic spread by way of the portal vein or the hepatic artery in association with a bacteremia or septicemia. When the disease is hematogenic, it usually is multiple, and the right lobe is involved more frequently than the left.

The responsible bacteria usually are pyogenic, the nonhemolytic *Streptococcus* and the *Staphylococcus* being the most frequent. *Escherichia coli* or one of the other gram-negative rods of the paracolon group also is frequently seen. Amebic abscesses are infrequent. Actinomycotic abscesses are seen rarely; there is such a case on my service at the Cincinnati General Hospital now. Echinococcus cyst with perforation and suppuration is very rare in this area.

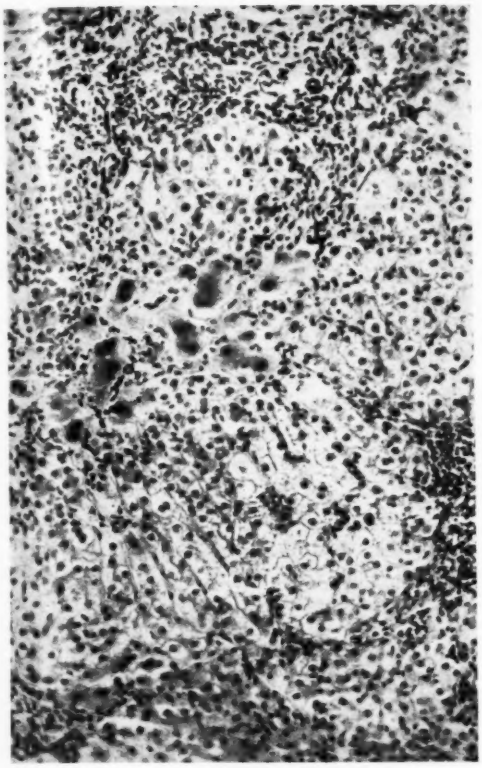

FIGURE 1. Photomicrograph of liver showing infectious hepatitis.

Liver abscesses are associated in 90 per cent of the cases with fever, either remittent or intermittent. Chills, sweats, pain in the right upper abdominal quadrant and shoulder pain have the same incidence of occurrence. If there is an associated pylephlebitis the chills are characteristic, being as a rule hard, bed-shaking chills, frequently lasting 30, 40 or 45 minutes. They are very striking and unforgettable. Hepatomegaly, nausea, vomiting, loss of weight and jaundice occur in 33 per cent.

I may be overemphasizing these symptoms, but possibly I have a fixation about them as the result of seeing members of my house staff and students failing to recognize them. It reminds me of the story about a psychiatrist interviewing a patient with a mental fixation on sex. He drew a straight line, asked the patient what it reminded him of, and the patient replied, "Sex." He then drew a circle and asked the same question. Again the answer was, "Sex." Then he drew a square, and the patient again said it reminded him of sex. The psychiatrist threw down the pencil. "Now, man, I must have more information than this. How can I help you if the only thing you think of is sex?" The patient replied, "Don't blame me, Doc. *You're* drawing these obscene and suggestive pictures."

The complications of liver abscess are septicemia, intraperitoneal rupture, intrapleural rupture and, rarely, lung abscess.

Treatment of Abscess of the Liver

Treatment of liver abscess consists of incision and drainage without contaminating the free peritoneal cavity, intensive antibiotic therapy, supportive therapy and, in rare instances, ligation of the portal vein. Personally, I have never done this. I believe the most important steps are incision and drainage of the abscess under the protective screen of systemically administered specific antibiotic therapy in such a way as not to contaminate the free peritoneal cavity.

The mortality rate in liver abscess is approximately 70 per cent in most series. If operation is not done, 90 to 100 per cent of the patients will die, and the mortality rate for those who are operated on is approximately 40 per cent.

Figure 2 illustrates a large abscess of the right lobe of the liver. We had previously made a subcostal incision, and had unexpectedly found this tense, swollen abscess in the right lobe covered by a pyogenic membrane. The wound was then closed and an incision was made directly over the abscess. The second wound was packed for three days with iodoform gauze, sealing the visceral peritoneum on the liver to the parietal peritoneum on the anterior abdominal wall. The abscess was then unroofed, employing the Bovie unit (figure 3).

Treatment of amebic abscess is primarily a medical problem, and Dr. Vilter will discuss it.

DR. VILTER: All patients with abscess of the liver do not necessarily have the symptoms and signs Dr. Altemeier mentioned. The in-

FIGURE 2. Abscess of right lobe of liver.

FIGURE 3. Drainage of abscess of right lobe of liver by Bovie excision of roof of abscess cavity.

ternist or general physician often faces the problem of a patient with liver abscess, either pyogenic or amebic, who seems to have merely a serious systemic infection.

I recall a patient I saw about a year ago who had had recurring episodes of diverticulitis for many years but had paid little attention to them. In December he had such an episode and went back to work, but in January he began to have low grade fever and anorexia. The fever increased in intensity and was followed by daily chills and drenching night sweats. His physician found absolutely nothing wrong on physical examination. He prescribed a broad-spectrum antibiotic, probably tetracycline, and the temperature gradually subsided. After the antibiotic was discontinued the temperature rose again. This happened three times. Ultimately the patient was sent to the hospital. There were no physical abnormalities other than slight enlargement of the liver and a questionable amount of liver tenderness. The syndrome of drenching night sweats, chills, high fever and severe anorexia continued. It was on the basis of the anorexia that we thought something was wrong with his liver, but we did not know what it was. A liver biopsy was performed. Usually, preceding the biopsy, one inserts a needle to inject procaine under the capsule, and uses this needle to probe the liver at greater depth to see if anything can be aspirated. To our great surprise, pus was aspirated, from which a hemolytic *Streptococcus* was cultured. Exploration was carried out, and the surgeon could not locate the pus in the liver. The patient was placed on large doses of tetracycline (to which the *Streptococcus* was sensitive) for four weeks, and gradually, with defervescence of temperature and return of appetite and strength, he got back to work and has been well ever since. Liver abscesses can cause obscure symptoms.

Amebic abscesses can act similarly. They still occur in this part of the country; actually 5 to 7 per cent of the population in Cincinnati are infested with *Entamoeba histolytica*. I don't know the figure for Cleveland, but I presume there are entamoebae around. Amebic abscesses are best handled medically. A

therapeutic test helps establish a diagnosis. Emetine in doses of 65 mg. daily by injection for a week is the specific, but it is somewhat dangerous. Chloroquine in the great majority of cases is safe and is also a very effective amebicide. I think probably chloroquine and DIODOQUIN® therapy (chloroquine, 1 gm. daily for two to three days and then 0.5 gm. daily for two weeks, followed by Diodoquin, 2.5 gm. daily for three weeks), repeated when necessary, will cure most amebic abscesses, even if they have penetrated the diaphragm into the chest and pleural cavity and the patient is spitting up "anchovy juice" sputum. Amebae will be eliminated from the gastroenteric tract as well. Sometimes needle drainage will be necessary. Only when these abscesses become secondarily infected should they be handled surgically.

Degenerative Changes in Hepatitis and in Alcoholism

Now I want to turn to the degenerative changes that occur after hepatitis and in the chronically malnourished alcoholic addict, because these are the two great causes for the cirrhosis with which we deal. The patient with posthepatitic inflammation, inflammation which continues long after the hepatitis should have subsided, ultimately will have postnecrotic cirrhosis. Figure 4 is an illustration of this condition. There are broad bands of fibrous tissue, cellular infiltration, and degenerating liver cells around the edge of the fibrotic reaction; there are scarring and cellular infiltration in the portal areas. Of course, the damage to the liver in the postnecrotic type of cirrhosis is widespread and does not follow anatomic boundaries.

Figure 5 illustrates a fatty liver. All the holes are filled with fat in life, and this is the stage in alcoholism and chronic malnutrition which eventuates in nutritional cirrhosis. Figure 6 shows the histologic appearance of nutritional cirrhosis. A great deal of fat still is seen, with small nodules of liver cell degeneration, much fine fibrous tissue, and cellular infiltration. The difference between the pathologic picture in nutritional cirrhosis and that in the postnecrotic type lies in the amount of

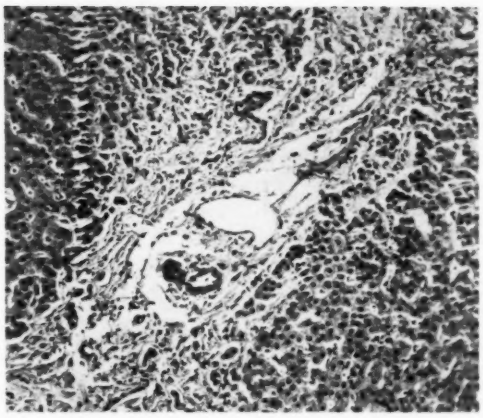

FIGURE 4. Postnecrotic cirrhosis of the liver.

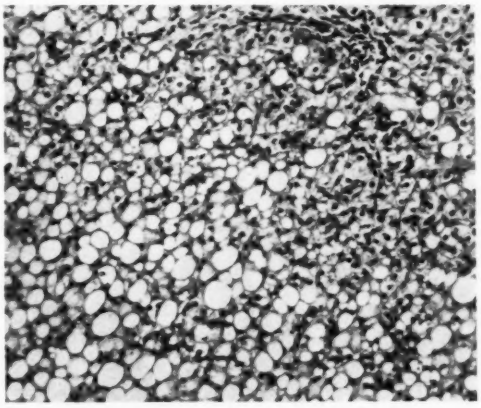

FIGURE 5. Fatty liver in a chronic alcoholic addict.

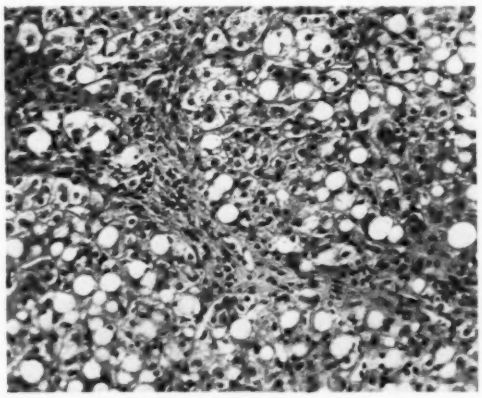

FIGURE 6. Nutritional cirrhosis.

scarring and in the architecture of the liver. In the latter the architecture is completely disrupted and scars are large; in nutritional cirrhosis the architecture usually is reasonably well retained and scars are fine.

For the patient with uncomplicated cirrhosis, a high vitamin diet (3000 calories, 120 gm. protein, 80 to 100 gm. fat) is advisable. Rest is important also. Most of the difficulties in management of cirrhosis come with the complications. The bleeding varix is the most dangerous.

Treatment of Bleeding Esophageal Varices

The fact that 50 per cent of patients with bleeding esophageal varices die during the first attack emphasizes the danger of the situation. The general physician or internist must give emergency treatment to these patients. Later he may call in a surgeon for help.

The first thing to do, of course, is establish that the patient does have a bleeding varix. It may be obvious because of a past history of cirrhosis, or it may not be obvious even though the patient is a chronic alcoholic addict. After instituting blood transfusions—and as much blood should be used as may be required to prevent shock—it may be necessary to examine the upper gastrointestinal tract roentgenologically to rule out the presence of duodenal ulcer. We know how often duodenal and even gastric ulcers occur in the chronic alcoholic addict or the cirrhotic patient, and a history of cirrhosis does not mean necessarily that bleeding from the upper gastrointestinal tract is the result of a bleeding varix.

Next, if the bleeding does not stop, one must use some type of balloon tamponade. The Linton or the Sengstacken tube certainly is satisfactory. The only thing I want to say about tubes with balloons for tamponade is that I do not like esophageal balloons. We have had a great deal of trouble with them because so often they produce erosions or even tears in the esophagus. The intern or resident doesn't handle the balloon properly; something may be wrong with the mechanism and the esophagus may be lacerated. I think the gastric balloon is of help; with the gastric balloon inflated and tension placed on the tube itself so the balloon comes right up into the cardiac end of the stomach and obstructs the varices as they course through the esophageal hiatus, bleeding may be controlled.

After bleeding stops, the balloon should stay in place 36 or even 48 hours. Then it should be deflated and left in place another 24 hours so that if bleeding recurs it can be reinflated. Meanwhile, to prevent hepatic encephalopathy, which frequently results from bleeding esophageal varices, we try to remove as much of the blood as possible by aspiration from the stomach and by administration of a magnesium sulfate purge through the gastric part of the tube. Giving neomycin may reduce the ammonia-forming bacteria in the gastrointestinal tract. We frequently give glucose intravenously, or DEXIN® or DEXTRI-MALTOSE® by mouth or by tube if the tube is still in place. We avoid protein because it provides the amino groups which intestinal bacteria release as ammonia. When the liver is incompetent to convert the ammonia into urea, or when there are collateral shunts around this organ, ammonia gets through to the systemic circulation and to the brain, where it is thought to interfere with the Krebs energy cycle. Hepatic encephalopathy results.

By all these maneuvers we may succeed in getting the patient to the point where a more definitive approach can be contemplated. We try to improve his nutrition, to get him in the best possible shape, and then we call our surgical colleague for help. First, however, we try to determine the internal anatomy of his abdominal vascular system.

Figure 7 is a photograph of a normal percutaneous splenoportogram. Radiopaque dye injected into the spleen outlines the splenic and portal veins very clearly, with a little reflux into the superior mesenteric. After the dye clears from the veins, a normal hepatogram is visible. Figure 8 illustrates an abnormal situation. The patient had polycythemia vera and thrombosis of the portal vein near the hilus of the liver. The splenic vein near the spleen narrows, suggesting old thrombosis and recanalization. Coming off at a point where the coronary vein arises are large varices go-

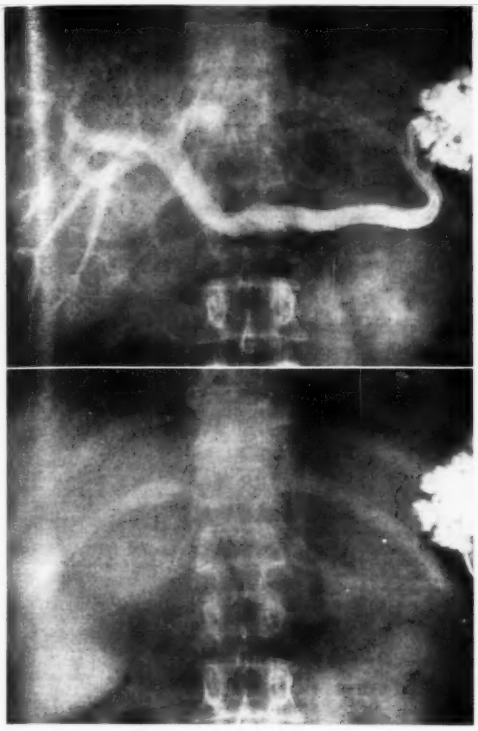

FIGURE 7. Normal percutaneous splenoportogram.

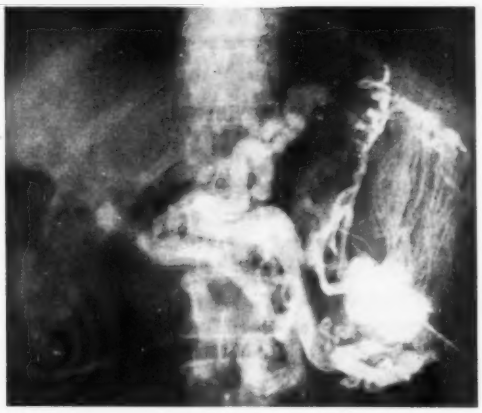

FIGURE 8. Splenoportogram illustrating extrahepatic block.

FIGURE 9. Barium outlining esophageal varices.

ing up to the esophageal hiatus. There are varices also surrounding the spleen and other collaterals descending downward on the left.

Figure 9 shows the familiar barium esophagram with the areas left by the varices as they protrude in the barium-filled esophagus. Our radiologists tell us that an expert examiner can demonstrate varices by this method with an accuracy of 70 per cent; if they are not demonstrated, splenic portography will help.

Having established the presence of varices and with the patient in reasonably decent condition, knowing that another episode of bleeding may well be lethal we call our surgical colleague. Dr. Altemeier, can you help us?

DR. ALTEMEIER: One of the great unsolved frontiers of surgery is the treatment of portal hypertension. If I seem to speak with any air of authority, I hope you will pardon me, because this whole subject is unsettled and in a state of flux.

Surgically speaking, we become interested in the patient with cirrhosis of the liver only when he has bleeding from esophageal varices or intractable ascites with or without bleeding.

In addition to postnecrotic and nutritional types of cirrhosis, occasionally another type caused by tertiary syphilis is seen. Known as hebar lobatum, it usually occurs in younger

persons, between 18 and 25 years of age. We have seen three such patients in the past 10 years who have had portal hypertension, esophageal varices and hemorrhage.

In the event of acute hemorrhage, as Dr. Vilter has said, some modification of the balloon tube usually is used. Unfortunately the tube has all too frequently been ineffective to control the bleeding. This is due not only to failure of the tube to occlude the bleeding points by pressure on the varices but also to the coexistence of bleeding ulcers of the mucosa of the stomach or duodenum. Unfortunately the last three cirrhotic patients I have seen, one of them only yesterday, have had multiple ulcers of both the stomach and the duodenum in association with bleeding esophageal varices.

What operations are available to control intractable hemorrhage from esophageal varices? One can attack the points of bleeding through incisions in the esophagus or stomach and a continuous running suture of 00 chromic catgut. Mediastinal packing also may be used,

FIGURE 10. Splenoportogram in case of portal hypertension and intrahepatic block. Large tortuous splenic vein is visible. Splenorenal shunt was performed, with good result.

but I think this has largely been abandoned as ineffective. Shunt operations—splenorenal, portacaval or other modification—are the most popular forms of operation used at present, particularly in the better-risk patients. The value of hepatic and splenic arterial ligation was explored about 10 years ago, but this procedure has generally been abandoned. I shall come back to it in just a moment.

The Phemister operation or esophagogastrectomy is still useful in selected cases of recurrent bleeding in which the spleen has been removed previously or a splenorenal or portacaval shunt has been attempted unsuccessfully. It carries an appreciable mortality, about 30 to 40 per cent.

Several years ago I had the privilege of attending Yale University Medical School as a visiting professor of surgery, and while there I became very interested in work being done by Dr. Hale in the department of pathology. The various circulations in the liver were injected with different-colored latex material to demonstrate three circulations. In patients with Laennec's cirrhosis there is a marked relative increase in the hepatic arterial circulation with a corresponding decrease in the portal venous circulation. This suggests that hepatic arterial ligation may have some therapeutic value. Six or eight years ago we did 18 hepatic and splenic arterial ligations in patients with Laennec's cirrhosis complicated by gastrointestinal bleeding, esophageal varices and ascites. These were desperately ill patients. For some reason which is not clear, one-third of the patients have not had a recurrent episode of bleeding and have remained well. In some the ascites has completely disappeared. I am not recommending to you to do hepatic and splenic arterial ligations until more information has been obtained. We have not done these ligations in any more cases since then, and are continuing to observe the small group of remaining patients to see what the ultimate outcome will be. I should like to stress, however, that there may be some factor operating here which is worthy of further investigation and thought.

Percutaneous splenic portography is of great value in selecting the type of operation to be

done in the patient who can undergo an elective shunt, as Dr. Vilter indicated. It will yield information on portal pressure, length and diameter of the splenic vein, patency and size of the portal vein, and presence and extent of esophageal varices. In the case illustrated in figure 10, it was elected to do a splenorenal shunt because of the size and tortuosity of the splenic vein and the presence of hypersplenism.

In doing splenorenal or portacaval shunt, I prefer a combined thoracico-abdominal incision for better exposure. In the past at our clinic the end to end type of portacaval anastomosis usually has been done. Recently there has been considerable discussion as to whether or not a side to side anastomosis is preferable to the end to side anastomosis as a means of decreasing further degeneration of hepatic function in the cirrhotic liver. It has also been used in the treatment of patients with ascites as an elective operative procedure. As illustrated in figure 11, the splenorenal type of anastomosis is made between the end of the splenic vein and the side of the renal vein.

I should like to point out some of the problems which plague surgeons in these cases. Patients who have histories of bleeding but are in good condition with relatively good hepatic function present no insurmountable problems, but patients with active bleeding not controllable by the tube and with poor hepatic function or associated hypersplenism present many serious ones. If an emergency portacaval shunt is elected, the magnitude of the procedure, duration of anesthetization and other factors frequently result in progressive impairment of liver function and the ultimate death of the patient within a period of three days to several months. More recently, Dr. Kierle of my staff has been doing emergency shunts in bleeding patients under hypothermia; it is too early to know the results. Another point I want to stress is that surgeons rely heavily on medical colleagues for advice and supportive therapy, particularly in that group of cases in which other factors contribute to the tendency to bleed apart from increased pressure in the portal vein. I wonder if Dr. Vilter could discuss this point.

Clotting Abnormalities in Cirrhosis

DR. VILTER: We frequently find clotting abnormalities in patients with cirrhosis. The abnormalities that may occur, and their frequency, as determined by Dr. Helen Glueck,

FIGURE 11. Splenorenal anastomosis, using Pott's clamps and arterial silk.

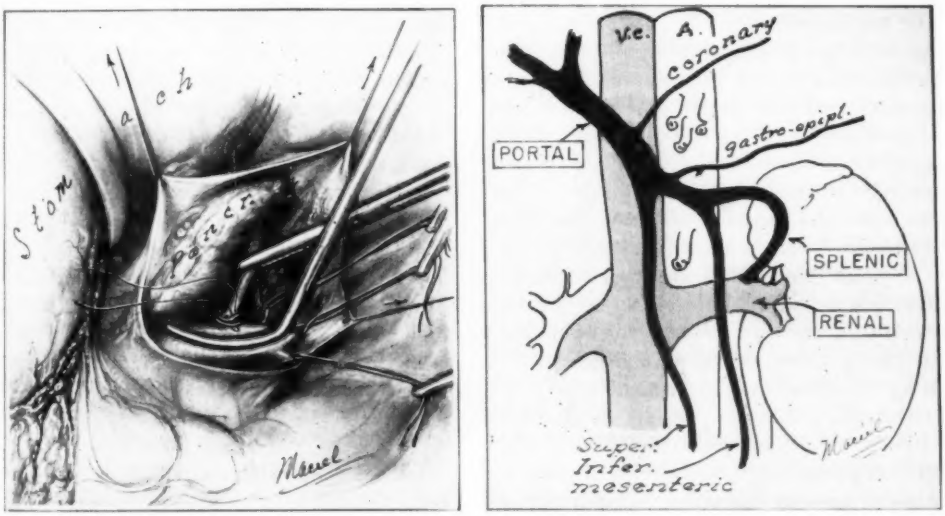

TABLE 1

CLOTTING ABNORMALITIES IN CIRRHOSIS

FACTOR	NUMBER OF PATIENTS STUDIED	NUMBER DEFICIENT
Prothrombin	58	50
Factor V	36	31
Factor VII	36	30
Platelets		Few
Fibrinogen		Very few
Fibrinolysins		Very few

who directs the Coagulation Laboratory at the Cincinnati General Hospital, are shown in table 1. Fifty of 58 patients studied were deficient in prothrombin; a deficiency of factor V was found in 31 of 36 patients; a deficiency of factor VII was found in 30 of 36 patients. Factors V and VII are involved in the conversion of prothrombin to thrombin.

In a few patients, fortunately not too many, one will find either hypersplenism accounting for platelet deficiency or an immunohumoral type of thrombopenic purpura. Even less frequently, but still often enough so that one should watch for it, one finds fibrinogenopenia, and when fibrinogen is deficient one may find active fibrinolysins. These things merit consideration when serious vascular surgery such as a splenorenal or portacaval shunt is being contemplated.

The prothrombin level in patients with cirrhosis is a good prognostic indicator. Prothrombin levels 20 per cent of normal or below were associated with severe toxic necrosis and fatal termination. At a slightly higher level, from 40 to 50 per cent of normal, are the patients with severe but not fatal cirrhosis. Patients with mild cirrhosis who will live have prothrombin levels in the 80 per cent range, and could be subjected to surgery without difficulty. The prothrombin level can be of prognostic aid in selecting patients for operation.

In trying to correct abnormalities of the clotting mechanism, the internist may try MEPHYTON®, but results usually are poor if the liver disease is severe. He will have to wait until liver function improves, with the type of therapy previously described, before proceeding with surgery. If the patient has thrombopenia, adrenocortical steroids or ACTH may be necessary to get the patient into condition for operation.

Management of Ascites

Massive ascites is exceedingly difficult to manage. We restrict salt, of course. We try to get the patient to eat a good diet with a reasonable protein content. We keep the patient at rest. Even though we know that diuretics may precipitate hepatic encephalopathy, we try MERCUHYDRIN®, and less often DIAMOX®, because the latter drug frequently will cause hepatic encephalopathy. We may even use ammonium chloride prior to giving Mercuhydrin, although we know that it, too, may precipitate encephalopathy. Fortunately, however, if hepatic encephalopathy occurs after the use of one of these agents, when the drug is stopped the patient usually improves and the hepatic coma disappears.

Except as an aid to diagnosis, paracentesis should not be performed unless it is absolutely necessary so that the patient can eat and breathe. Abdominal paracenteses deplete protein and electrolytes and may precipitate hepatic encephalopathy.

A great deal of investigation is being carried on concerning the use of prednisone or antiadrenocortical substances such as amphenone. These are in the experimental stage and, again, more often than not produce a sodium diuresis and precipitate hepatic encephalopathy. So I think the internist has to depend on the old reliable forms of therapy in ascites.

Does the surgeon have anything else to say about this, Dr. Altemeier?

DR. ALTEMEIER: I have very little to add. Most of the operations devised for continuous drainage of ascitic fluid into the venous circulation or into the retroperitoneal or soft tissues of the abdominal wall have failed. The only real hope is in medical treatment. In a few cases hepatic arterial ligation or portacaval shunts have been of help.

Biliary Cirrhosis

DR. VILTER: Biliary cirrhosis is an exceedingly difficult subject, because there is so little

we can do about this disease and it is so difficult to make an accurate diagnosis.

As you know, there are two types of biliary cirrhosis. We speak of primary biliary cirrhosis and of the extrahepatic variety. Primary biliary cirrhosis is the result of hepatitis, usually the cholangiolitic or pericholangitic type. It can occur also as a result of toxic changes due to drugs. Chlorpromazine can produce jaundice which can eventuate in primary biliary cirrhosis, as can methyltestosterone and arsenic. On the other hand, there is the extrahepatic variety in which a stone in the common duct produces long-standing obstruction and jaundice. Either of these two situations may produce the same clinical picture, which is what makes differentiation so difficult. The patient has jaundice, itching and hepatomegaly. Liver function is not too severely impaired. Ascites and esophageal varices develop only late in the course of the disease, in contrast to what one sees in postnecrotic or nutritional cirrhosis. There may be high blood levels of fat and cholesterol, and xanthomatosis of the skin may develop, a syndrome that has been called xanthomatous biliary cirrhosis. There may develop abnormalities of absorption from the gastrointestinal tract, a spruelike syndrome and, as a result, osteomalacia. Often the only way to distinguish between primary biliary cirrhosis and the extrahepatic variety is by liver biopsy.

Figure 12 is a photomicrograph of the liver of a patient with secondary biliary cirrhosis. One can see infiltration of inflammatory cells around large and small bile ducts, a few bile lakes, and reduplication of bile ducts, all characteristic of the liver in extrahepatic biliary obstruction. The liver cells are well preserved. In primary biliary cirrhosis there is some degeneration of liver cells and there is more inflammatory reaction, but with less reduplication of small bile ducts and with no dilation or involvement of the larger bile ducts.

Diagnosis is so difficult that unless one is absolutely certain of the type of cirrhosis the patient should be subjected to exploratory operation. Dr. Altemeier, I think the surgeon can perhaps offer more than we can in the management of such a patient. We really have little to offer other than protecting the liver cells as long as possible. Would you like to describe the surgical approach to this problem?

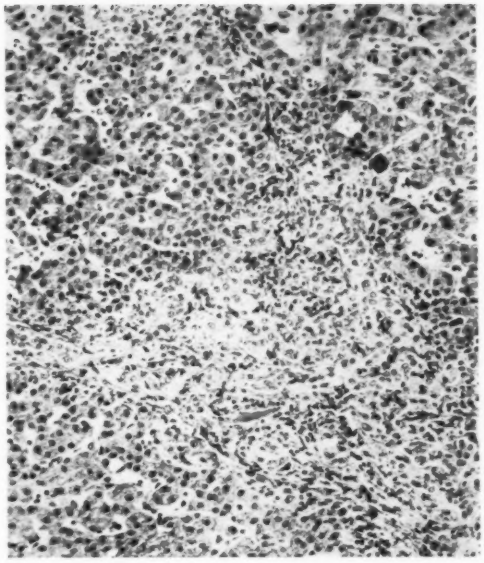

FIGURE 12. Photomicrograph of secondary type of biliary cirrhosis due to carcinoma of the common bile duct.

DR. ALTEMEIER: In patients who have biliary cirrhosis secondary to an intrahepatic or extrahepatic block of the biliary tree, relief of the point of blockage often brings marked improvement in the patient's condition. The old method of doing an anastomosis over a VITALLIUM® tube to relieve a block due to a stricture has been abandoned because the tube always became plugged with sludge or bile mud after a variable period. For a while we used a method advocated by Arthur Allen, making an anastomosis between the jejunum and the hepatic duct using the end of a catheter as a splint. We have given up this method also, and instead we make a direct anastomosis either between the hepatic duct and the duodenum or between the hepatic duct and the jejunum, using a T tube as a splint for six months or longer depending on the individual case. Many people seem to have an aversion to using T tubes for long periods, but I do not share this feeling. I have left them in place for 14 months in some cases.

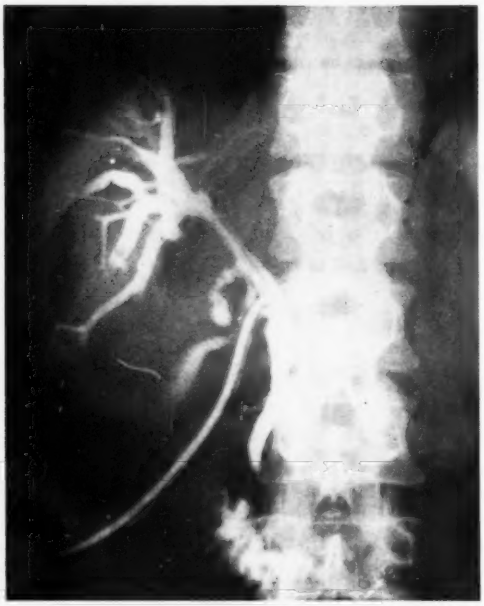

FIGURE 13. Recurrent stricture of left hepatic duct interpreted as benign sclerosing cholangitis until autopsy. Lesion was sclerosing carcinoma of the intrahepatic biliary tree.

Occasionally we see what appears to be a stricture in the hepatic duct or in the intrahepatic biliary tree (figure 13). This will be reported usually as an inflammatory process or specifically as obliterative cholangitis. Personally I have never seen a proved case of inflammatory obliterative cholangitis, and in discussing this with Dr. Whipple I find that he has not had any definite, proved pathologic evidence of this type of progressive inflammatory stricture either. Recently we have become interested in this problem and have found several cases of so-called obliterative cholangitis to be slow-growing, sclerosing carcinoma of the bile ducts. In one instance the left hepatic radicle was the seat of a primary intrahepatic sclerosing carcinoma. Review of all the sections taken in this patient, which previously had been reported as sclerosing cholangitis, revealed that the low grade carcinoma was present in all and that there was a marked fibrotic reaction about the nests of tumor cells. Since reporting this case two years ago, there have been six other cases of sclerosing carcinoma of the intrahepatic bile duct reported. Dr. Frank Glenn of New York has reported three, and there have been other scattered cases throughout the country. This lesion is worthy of further observation, and I think it would be wise to keep in mind the possibility of sclerosing carcinoma in your patients with recurrent stricture of the hepatic duct.

For some reason in our cases it has involved the left hepatic ductal system in the majority of instances, and this suggests that the lesion might be amenable to resection of the left lobe.

So often in these cases there is an associated biliary cirrhosis. If the obstruction is not treated successfully and promptly the biliary cirrhosis may become of increasing importance as a cause of morbidity and mortality.

The photomicrographs and illustrations of percutaneous splenic portography are from the collection of Dr. Leon Schiff, Director, Gastric Laboratory, Cincinnati General Hospital, Cincinnati, Ohio.

Food Intolerance in Early Infancy

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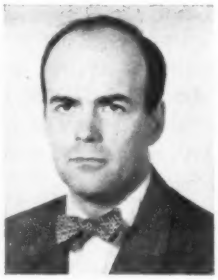
In early infancy, cow's milk produces more symptoms of intolerance than any other food. Cereals, egg, vegetables and fruit are next in order of importance. Diagnostic aids include dietary control, the clinical picture and family history. Early recognition and management may protect the patient against future allergies.



VICTOR C. VAUGHAN, III

In their natural course of evolution, symptoms of allergy in infants, children and adults often appear to be caused in earliest infancy by foods, somewhat later by household inhalants such as house dust, feathers and wool, and only in later childhood by such seasonal inhalants as pollen and molds. The early prime position of foods as causative agents may depend on a number of considerations, such as (1) opportunities for exposure before birth to material ingested by the mother, (2) immaturity of the gastrointestinal tract in the first weeks after birth, and (3) the inherent sensitizing potential of material ingested by mother or infant.

Investigators generally agree that early in an infant's life, cow's milk produces more symptoms of intolerance than any other food. This is not remarkable since pregnant women are urged to drink more than ordinary quantities of it, most infants in our society receive it as the sole or principal source of nutrition for many months, and it appears to have a moderately high sensitizing potential (possibly as a result, in part, of the first two considerations mentioned).

The frequency with which cow's milk causes food reactivity in infants and children has invoked great divergence of opinion. Clein[1] rates the frequency of milk reactivity as high as 6 per cent, while Collins-Williams[2] found it present in only 0.3 per cent of 3000 infants and children in whom he felt factors were controlled which might have led to an unnaturally high incidence. The careful studies of Bachman and Dees[3] revealed intolerance to cow's

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milk in 1 per cent of children who were otherwise well; these same studies emphasize the importance of cow's milk as a reactant by showing that it is responsible for symptoms in 30 per cent of allergic infants.

Divergent opinions regarding the frequency of allergy to cow's milk depend on the nature of an observer's medical practice with infants and children, his interest or belief in the possibility of milk allergy as a common cause of distress in early infancy, the observant nature of the infant's mother, the quality of communication between physician and mother, and the stringency of criteria by which milk allergy or intolerance is diagnosed.

Other factors, too, lead to uncertainty regarding the frequency of intolerance to milk. In many infants a disturbance apparently caused by milk intolerance is only temporary. An infant who seemed intolerant of milk at two or three months or following an episode of acute gastroenteritis may accept it with impunity at four to six months; moreover, although in retrospect it often appears that children having typical allergic difficulties were intolerant to milk in early infancy, a diagnosis of intolerance is often made in families having no other typical allergic manifestations, such as hay fever, asthma or eczema. Many physicians believe these considerations cast doubt on the original diagnosis. In any case, it is perhaps preferable to use the word "intolerance" rather than "allergy" to describe these reactions, since their nature is poorly understood and their relationship to accepted allergies is not clear. Whatever term is used, it seems, as Bachman and Dees have suggested, that a clear-cut demonstration of symptoms on ingestion and relief when a substitute is offered should sufficiently establish the role of milk or food reactivity as a source of difficulty. The estimate made by these authors that 1 per cent of otherwise well infants have an intolerance to milk indicates that such intolerance is a major medical problem. The problem may be appreciated in a somewhat more mundane perspective if we remember that this is approximately the same proportion of infants in this country that bear the most common surname of Smith.

Few foods other than cow's milk produce symptoms in the very earliest weeks of infancy. Moore[4] has placed wheat, citrus fruit, vitamin products and egg as next in order of importance. It is quite likely that egg has a very high inherent sensitizing potential in susceptible infants. Small amounts of egg have been known to provoke severe symptoms on earliest exposure, and often, apparently, as a result of sensitization acquired during the intra-uterine period. Hill[5] believes that reactivity to egg is of particular importance in determining the cause of eczema in many infants; indeed, the prevalence of skin manifestations in food reactivity involving egg is so general and often so typical that in early infancy much less uncertainty attends the diagnosis of egg allergy, it would seem, than attends that of milk intolerance. On the other hand, in many infants, egg and milk intolerances produce the same symptoms. Such controversy as exists is often created by vagueness of symptoms and by the fact that they frequently result from other common disturbances, such as mild respiratory infection, faulty feeding technics, parental anxiety and, perhaps, other inborn characteristics not involving cow's milk, e.g., a general level of irritability or "hypertonicity," whatever that may be.

Clinical Picture

Food intolerance, regardless of the inciting agent, will produce numerous symptoms. Clein has listed in order of decreasing frequency the following symptoms, which are the potential results of milk intolerance: eczema, pylorospasm, colic, diarrhea, "very unhappy all the time," cough, croup, choking, gagging, excess mucus in throat, "nose cold all the time," constipation, asthma, "refuses milk entirely," anorexia, "toxemia," apathy, listlessness, cyanosis, collapse, urticaria and angioneurotic edema. He believes that skin eruptions otherwise referred to as "heat rash," "cradle cap," "teething rash," "diaper rash" and the like are often related to cow's milk in the diet. I would judge that the most characteristic response to food intolerance in infancy is some form of *rejection* of the offending substance, which is manifested by simple distaste with

refusal to nurse, spitting up, vomiting or diarrhea; either of the last two symptoms may on occasion be quite violent and projectile. In Clein's patients, symptoms relating to the respiratory tract were about half as frequent as those involving the gastrointestinal tract.

Clein found that approximately 40 per cent of infants with milk intolerance have symptoms within the first month of life, and 82 per cent within the first four months. In these infants, there is a pattern of reaction that has several of the features stressed by Clein. This reaction pattern is by no means unusual, and it is virtually pathognomonic of intolerance to cow's milk. The usual course of events is as follows: A hungry, active infant is offered a bottle of whole cow's milk. After grasping the nipple eagerly and taking a suck or two, he turns away from the nipple, expressing disgust or distaste. He continues to be hungry, but will take the milk only with urging. After he has taken an ounce or two, he spits up or vomits most or all of it, following which he is sometimes able to empty the bottle. He may retain this food, but he is likely to be irritable and upset for the next hour or two because of colicky pain, gas and, sometimes, rather frequent small, wet and gaseous stools. The behavior of these infants may suggest hypertrophic pyloric stenosis or adrenal insufficiency, both of which should be considered in newborn infants who have conspicuous vomiting. But in neither of these conditions does a hungry baby show the peculiar distaste for and rejection of cow's milk, which are characteristic of milk intolerance.

Often such infants will gain weight reasonably satisfactorily; however, a few are unable to maintain satisfactory weight gain as long as they receive cow's milk, and others gradually or rapidly decline. Variations in the reaction pattern previously described are common. Instead of turning away from the offered nipple, a few infants appear to express their aversion by nursing with a bizarre, intermittent and irregular *gulping* action, accompanied by more than ordinary thrashing about or irritability during the nursing period. When the characteristic pattern is not present, the diagnosis of milk or other food intolerance in early infancy rests on the presence of highly suspicious gastrointestinal or respiratory symptoms which are otherwise unexplained.

Family History

A family history of food intolerance may be of value, and often will be found unexpectedly specific for milk. We have been strongly impressed with the frequency with which this occurs. The history may consist of nothing more than a distaste for milk, accompanied by mild gastrointestinal distress after ingestion; but, sometimes, without other allergies, persistent violent reactivity to cow's milk may extend from infancy into adult life. The reaction is perhaps expressed most often as diarrhea. Occasionally, a mother will disclose that she drinks cow's milk only when she is pregnant and only at the urging of her physician, because at other times milk causes distress. The parents of every infant suspected of being intolerant to cow's milk should be asked the direct question, "Do you like milk?" The reasons for a negative answer should be carefully explored.

Dietary Control in Diagnosis

Although the clinical picture and family history may be helpful, the most important consideration in diagnosing food intolerance in early infancy is the demonstration that removal of a given item from the diet frees the infant of symptoms and its return causes recurrence of symptoms. As has been emphasized, cow's milk is the most likely offender, followed by cereals (especially wheat), egg, vegetables and fruits. Although I have not seen any clear-cut instances of such cases, it is possible that an infant who is basically reactive to cow's milk may be clinically tolerant of it except when he is eating one or more other foods which add to his level of reactivity. However, most often, in early infancy, food reactivities are caused by a single item, and are demonstrated either by substituting some other product for cow's milk or by removing another offending item from the diet.

Cow's milk substitutes—Since substitutes for cow's milk are becoming numerous and more widely used, familiarity with the indica-

tions for their use has increased. These substitutes consist of soybean products (MULL-SOY® or SOBEE®), predigested cow's milk products (NUTRAMIGEN®) and formulas, such as those having a meat base, which are derived from other sources. Physicians treating food intolerance should be familiar with several or all of these substitutes; for while it is commonly found that an infant will accept with great pleasure the first substitute offered and obtain relief at once or within two or three days, occasionally another substitute must be tried before relief is obtained, even when both of the foods are derived from soybeans. These curious preferences of the infant are not readily explained. However, they do make it imperative that an infant whose difficulty seems clinically to be food intolerance should have the benefit of a trial on the available milk substitutes before dietary measures are abandoned as a means of relief.

Basic fluid nutrient—A further word of caution is urgent. When attempting to establish a diagnosis of food intolerance through control of the diet, the most urgent need is finding a basic fluid nutrient. While this basic substance is being sought, the infant's diet should not include anything else. The diagnostic and therapeutic picture becomes hopelessly muddled if one item or another is removed from a rather complex diet in the hope that it will prove to be a specific agent. During the three to five day trial of a milk substitute, the infant should not receive even a vitamin supplement. Later, vitamins and other necessary items may be added to his diet in a regular manner, and systematic observations may be made concerning the reappearance of symptoms which have been controlled.

Food-Symptom Relationship

The question commonly arises as to how convincing a cause-and-effect relationship between food and symptoms must be before the diagnosis of specific food intolerance can be accepted. When symptoms are dramatically relieved by exclusion of an offending substance, verification of diagnosis scarcely seems necessary. Indeed, in infants with violent reactivity, attempting to verify the diagnosis may be dangerous. I have seen one fatality in which the direct contributing factor was the feeding of milk to an infant in whom there was every reason to suspect violent reactivity. On the other hand, it may be only after two or three food trials that the diagnosis of intolerance is proved beyond reasonable doubt.

Difficulties arise from the sometimes temporary nature of the intolerance, as was previously mentioned, as well as from the possibility that clinical symptoms in some infants appear only as a result of multiple coincidental factors, of which reactivity to milk or some other food is only one. Alarm has been expressed at the frequency with which infants are given a restricted diet on inadequate evidence that food intolerance plays a major role in production of symptoms.[6] That dietary measures should sometimes be advocated under such circumstances is not surprising in view of the difficulties in establishing a firm diagnosis in some infants. It is highly incumbent, to be sure, on the physician caring for a child with vague complaints that he not seize on milk allergy as the explanation for all the ills of infancy. However, a wisely chosen and continuously supervised diet in which substitutions are intelligently made for substances which have a high probability of producing symptoms should not cause nutritional difficulties or growth disturbances in otherwise healthy infants.

Closely related to concern regarding the firmness of diagnosis of food intolerance is the question of how long a substituted diet should be given an infant whom it seems to benefit. I am personally convinced that neither of these problems can be separated from the consideration of *prophylaxis* in infant and childhood allergy.

Glaser[7,8] has advanced the argument that systematic exposure of infants in the early months of life to substances of high-sensitizing potential may condition those who are susceptible in later life to such typical allergic manifestations as eczema, hay fever and asthma. Why early exposure to potentially sensitizing material should have such an effect is uncertain. Glaser has pointed out that the explanation is very unlikely to be simply that

the gastrointestinal tract may be especially permeable in the young infant. On the contrary, a variety of frequently observed clinical phenomena attest the *complexity* of the allergic reaction against the concept that allergy involves a one to one correspondence between allergen and symptom in an allergic person. It is well known that one allergen may potentiate another in producing clinical symptoms, and results of clinical observation suggest that a heavy allergic load is borne with increasing difficulty, whereas the minimal load may be increasingly well tolerated.

As a logical consequence of Glaser's argument, these phenomena support the hypothesis that avoiding substances of high-sensitizing potential in early infancy may delay or entirely avert later allergic difficulties. Glaser himself has amassed an impressive amount of statistical data which indicate that such a relationship does in fact exist between early exposure to allergens and excitation of the allergic state. It may be that only carefully planned prospective studies carried out over many years will assess accurately the magnitude of the effect which Glaser describes.

Meanwhile, there are certain sensible routines in feeding infants who present highly suspicious or convincing evidence of food intolerance or whose family data present strong presumptive evidence that they may be prone to the development of major allergies:

1. I echo Glaser's plea that breast feeding be the major source of food for these infants during the early months of life. All too frequently a physician will advise a mother to abandon breast feeding because he believes it is contributing in some way to symptoms that are actually being caused by the recent introduction of cow's milk as a supplement to the mother's own milk supply.

2. When infants in the previously mentioned category cannot take human milk, they should receive a substitute for cow's milk, if it is tolerated best. However, even when cow's milk is apparently well tolerated most or all of the time, it should be provided in its most hypoallergenic form. In general, because raw and pasteurized whole milk are the most likely to cause an allergic reaction or other intolerance, they should be replaced for as long as possible by evaporated milk or other proprietary products that are generally less sensitizing and allergenic. We have often observed the onset of symptoms of milk intolerance shortly after a mother has changed from evaporated milk to whole milk in the mistaken notion that this was an inevitable step in her infant's growth and development, a sign of progress that should be evidenced as soon as possible. I urge that infants with suspected food intolerance or presumed allergic constitutions be given evaporated milk, generally diluted with equal parts of water, for as long as they can tolerate it. This will often be for at least two to two and a half years.

3. It may be wise to feed these infants, and possibly some "normal" infants, milk substitutes during the acute and convalescent phases of gastroenteritis, particularly in severe cases. Gruskay and Cooke[9] have shown that during convalescence from acute gastroenteritis the absorption of egg albumen given by mouth is greatly enhanced, which may well increase the likelihood of reactivity to material of high-sensitizing potential in susceptible infants.

4. In exceptional instances, as Glaser has suggested, it may be appropriate for a mother found capable of producing highly allergic children to maintain a hypoallergenic diet during pregnancy, particularly with respect to cow's milk and eggs.

Conclusion

It is difficult in a presentation of this type to do justice either to the great variety of ways in which food intolerance may be manifested in early infancy or to the variety of opinions which are associated with questions of frequency, probable importance, management and prophylaxis. Clein[1] has presented comprehensively the varied clinical picture. I have emphasized a single rather common pattern which may be associated with other symptoms described by Clein. There is abundant evidence that food intolerance is a major medical problem in early infancy and a strong suspicion that, although the condition is benign and often regarded as a mere nuisance to be outgrown, its early recognition and adequate

management may protect the patient against later development of allergies.

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INTERSTATE POSTGRADUATE MEDICAL ASSEMBLY

Nov. 2-5 Palmer House Chicago, Illinois

Thyroid Function in Pregnancy

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The level of the circulating thyroid hormone normally increases during pregnancy. The administration of estrogen also can induce an increase of this hormone in men and women. The fundamental reason for the rise seems to be the increased ability of the serum proteins to bind thyroxin. In addition, the basal metabolic rate increases during pregnancy. When hyperthyroidism coexists with pregnancy, the treatment of choice is the administration of antithyroid drugs in amounts which will be physiologic for pregnancy but not for the nonpregnant state. Although the goitrogens pass the placental barrier, the fetus is endangered only when the level of the circulating thyroid hormone falls below the normal range of pregnancy.

The Role of Hiatal Hernia in the Differential Diagnosis of Gastrointestinal and Cardiac Disease

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Hiatal hernia, a great mimic of other lesions, is one of the most common causes of substernal and upper abdominal complaints in middle-aged and older persons, and frequently is associated with angina pectoris, degenerative cardiovascular disease, gallbladder disease or peptic ulcer. Concomitant hiatal hernia and peptic ulcer can result in complications such as reflux esophagitis, esophageal ulcer and stenosis; hiatal hernia associated with coronary artery disease can precipitate angina.

HENRY L. BOCKUS

HIATAL hernia, the displacement of the abdominal esophagus or part of the stomach, or both, through the hiatus oesophageus into the lower part of the chest, is being recognized as one of the most common lesions in the upper alimentary tract, and certainly its clinical significance is increasing as more is known about it.

The three principal types of hiatal hernia have different implications clinically. In the Akerlund I type the esophagus seems to be short, and the part of the stomach above the diaphragm seems to be tubelike. The angle at the junction of esophagus and stomach is obtuse, not acute. It is in this small type of hernia, also termed the Allison sliding type, that we most often encounter the symptom of pyrosis. Reflux esophagitis is much more common in this variety, and, unfortunately, at times esophageal ulcer and stenosis occur later. Figure 1 is an example of the Akerlund I sliding hernia. It is very difficult to tell where the stomach ends and the esophagus begins. These hernias, when they are very small, are rather difficult to diagnose.

The second type, the Akerlund II or paraesophageal hernia, Allison terms the "rolling" hernia. Often the upper end of the stomach, a small part of it, rolls alongside the esophagus and emerges through the hiatus oesophageus

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FIGURE 1. Akerlund I (Allison sliding) hernia.

FIGURE 2. Akerlund II hiatal hernia. The pouch is fixed above the diaphragm and contains a large magenblase.

above the diaphragm. This hernia increases in size more often than does the first type. It gives rise to pyrosis less often because reflux of gastric juice into the lower esophagus occurs less often. It becomes a fixed hernia more often, and the most common complaints are pain and dysphagia; cardiac and pulmonary symptoms are rather common. Figure 2 is an example of the Akerlund II type; a rather large fixed hernia emerges along the side of the abdominal esophagus containing a large magenblase.

The third type, the Akerlund III or esophagogastric hiatal hernia, is larger. Both the abdominal esophagus and the stomach are above the diaphragm. Probably many of these hernias begin as paraesophageal hernias. Often these stomachs become the so-called upside-down stomachs. Volvulus is rather common with these larger hernias, and, once again, cardiac and pulmonary symptoms are rather frequent. Figure 3 is an example of this type of hernia. The esophagus is redundant as a result of the upward displacement of its abdominal portion.

Pathogenesis

There are three main defects which our surgeons find in association with most hiatal hernias: (1) a redundant sac in the posterior mediastinum; (2) a stretching of the ligament between the esophagus and the diaphragm; and (3) a stretching or distortion of the collar of the hiatus oesophageus. It is more important clinically to remember the factors which seem to be responsible for initiating discomfort in many cases of hernia and which perhaps have been responsible in part for causing the hernias initially. Anything which increases intra-abdominal pressure may fall in that category, including severe squeezing trauma, multiple pregnancies, ascites, strenuous physical exertion from lifting, coughing (even from smoking too many cigarettes), vomiting, straining at stool, tight corseting, and so on.

Hernias are more common in obese persons than in those of normal weight, and their incidence is a little higher in association with kyphotic spines. Some workers believe that some hernias begin because of primary irri-

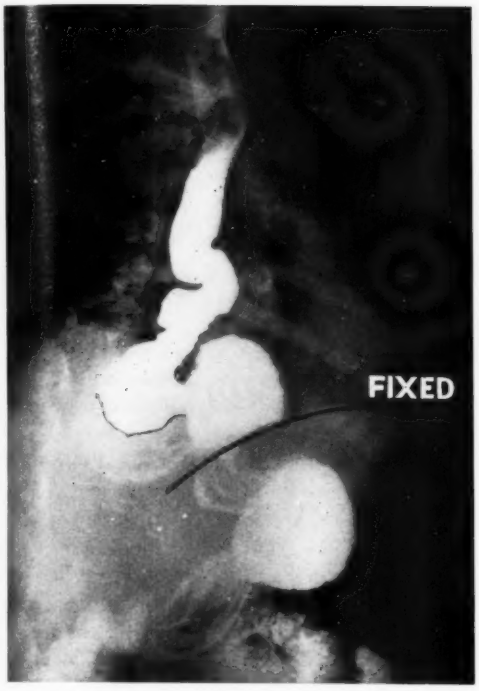

FIGURE 3. Akerlund III (esophagogastric) hiatal hernia. The abdominal esophagus and the upper third of the stomach are fixed above the diaphragm.

tation in the esophagus, producing vagal irritation and resulting in retraction of the abdominal esophagus above the diaphragm. Probably that is not a common way for hiatal hernias to originate; however, undoubtedly it does occur.

We do not know how many persons have hiatal hernia without symptoms, because there are no reliable autopsy statistics. It is a very difficult lesion to find at autopsy unless the hernia is large and fixed. There are several large series of cases reported based on roentgenologic study of patients with digestive tract symptoms. In Nuzum's series 12 per cent of 900 patients with digestive symptoms had hernias. Brick reported an incidence of 9 per cent in 3500 patients similarly studied; hernia was a cause of digestive complaints in about half as many cases as was duodenal ulcer. It is important to remember that the incidence of hiatal hernia increases steadily with advancing years. Obesity, late life and habitus hypersthenicus are conditions we are likely to see in a patient with hiatal hernia.

Symptom Configuration

I think many of us are in the habit of saying that many hernias are silent and do not cause symptoms. I do not believe this. We have taken new histories from patients whose hernias have been found incidentally, and most of them have had symptoms, though often mild, infrequent and insignificant.

The most important symptom in hiatal hernia is *heartburn* or *pyrosis*, a sensation of warmth under the low substernum and in the xiphoid area. Indeed, any patient in middle or late life who has repeated episodes of heartburn stands a very considerable chance of having a hiatal hernia. Hiatal hernia is the most common organic cause for heartburn, and this symptom is found in 75 per cent of all cases of symptomatic hiatal hernia. Pyrosis is not always due to associated esophagitis; in many cases of heartburn and hiatal hernia, esophagoscopic examination shows no evidence of esophagitis. The chances are, however, that the heartburn is associated with reflux of gastric juice in most instances. Reflux may occur, and undoubtedly does, intermittently for weeks, months or years in certain persons without the development of esophagitis. The heartburn of pregnancy, particularly in multiparas, is more commonly associated with hiatal hernia than not. A considerable number of patients with heartburn have regurgitation and vomiting, but they comprise less than 50 per cent.

Pain, the second important symptom, usually is located in the low substernal area or in the epigastrium. I shall discuss its similarity to angina later on. The pain of hiatal hernia usually is related to eating and to posture. It is likely to occur early in the postprandial cycle, that is, in the first hour after meals. It is also likely to occur when the patient is reclining. Hiatal hernia is one of the most common causes of being awakened night after night with substernal and epigastric distress, often of a burning nature. The pain, and particularly the heartburn, frequently may be

brought on by stooping or by activities which increase intra-abdominal pressure (vomiting, coughing, straining at stool, strenuous physical exercise, lifting). The pain of hiatal hernia of the sliding type is commonly alleviated by assuming the erect or sitting position, and the medication which frequently relieves it is antacid.

Gaseousness is very commonly associated with hiatal hernia, and I shall refer to that interrelationship later on.

Anemia is present in some 10 to 20 per cent of cases of hiatal hernia; that is, it is assumed to be due to the hiatal hernia in 10 to 20 per cent. Massive hemorrhage is relatively rare, however, unless there is a complication such as peptic ulcer.

Cardiac and pulmonary symptoms are rather common and will be discussed later.

Diagnosis

The diagnosis of hiatal hernia is a radiologic one. Heartburn, early postprandial pain in the substernal area or epigastrium, pain brought on by lying down, and dysphagia are symptoms which would cause one to think of hiatal hernia, and they demand careful roentgenologic study. Small hernias are easily overlooked on casual routine examination. Ordinarily the hernia is best demonstrated with the patient reclining, often with the head low, and by using maneuvers to increase intra-abdominal pressure, such as a belt or a compression apparatus, or overfilling the stomach. An effort is always made to demonstrate reflux, particularly in patients with pyrosis.

Esophagoscopic examination is necessary as a corollary in about 50 per cent of cases of hiatal hernia with severe symptoms. One must determine whether or not a complication is present; particularly in cases of small hernia one must rule out esophagitis, esophageal ulcer, and beginning esophageal stenosis. It is equally essential to exclude a concomitant lesion, particularly a neoplasm in the pouch or in the lower esophagus. Remember that these patients are in the cancer age; consequently a certain number of them will have neoplasms. Concomitant peptic ulcer is relatively frequent.

Cardiovascular Interrelationships

I particularly want to stress the interrelationship of cardiovascular disease and hiatal hernia. Here are two conditions whose incidence gradually increases with advancing years. The most interesting concomitance is that of angina pectoris and hiatal hernia. In Gilbert's series 40 per cent of 44 patients with angina pectoris also had hiatal hernia. In Nuzum's series 25 per cent of 100 patients with angina pectoris had hiatal hernia. On the other hand, Brick reported that 28 per cent of 308 patients with hiatal hernia had a coronary artery syndrome. This means that in every patient who has substernal distress one must consider hiatal hernia in the differential diagnosis. I am one of those who feel that a diagnosis of angina pectoris is justified in any instance of substernal pain which is brought on only or principally by effort, regardless of the result of objective examinations. However, many of these same patients with angina of effort may have pain in the same location occurring under other circumstances, e.g., after eating or at night. In such patients with pain brought on not only by effort but also by eating, by overdistending the stomach or by reclining, the likelihood of concomitant hiatal hernia is great.

There are several clues which one should keep in mind. Does the patient have pyrosis? Does he occasionally express the feeling that food does not go through the esophagus quite normally? Is the pain brought on by eating? May it be brought on by reclining? Any of these manifestations in a patient with angina should cause the physician to believe that something other than angina may be present. This has tremendous importance, because the symptoms of hiatal hernia in a patient with coronary artery disease may exert a deleterious effect on the heart. Stimulation of the vagal nerve endings may reduce coronary blood flow as a result of ischemia, thus actually producing an attack of angina. Therefore, treatment of angina pectoris in a patient who also has hiatal hernia must include measures to eradicate the hernia or at least alleviate hernial attacks.

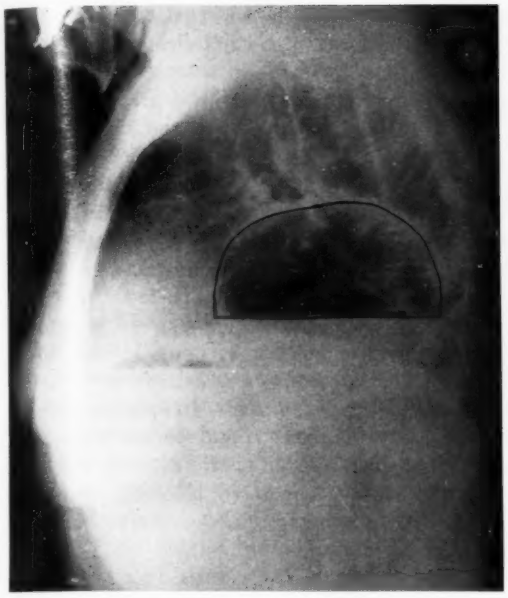

FIGURE 4. Gas trapped in supradiaphragmatic stomach pouch in hiatal hernia which has undergone volvulus. Clinical configuration indistinguishable from myocardial infarction.

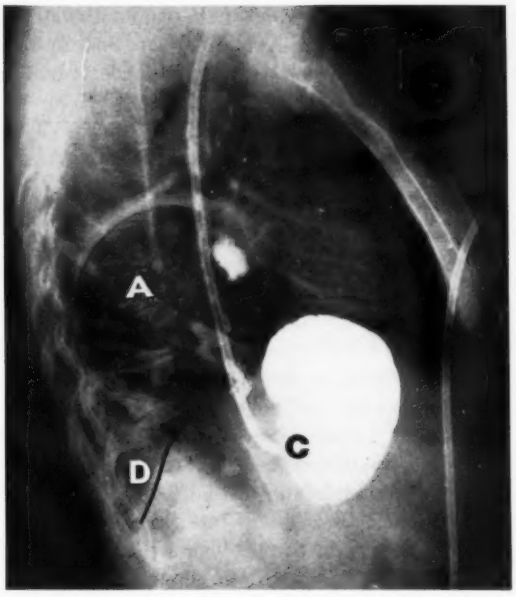

FIGURE 5. Same case as figure 4. Note upside-down stomach. A, antrum; C, cardia; D, diaphragm. Deflation occurred with intubation, and hernia was subsequently repaired.

A second influence to keep in mind is that some of the larger hernias undergo volvulus and trap air above the diaphragm, giving rise to crisislike attacks with severe cramping, viselike pain, cyanosis and symptoms quite suggestive of myocardial infarction. Figures 4 and 5 represent volvulus (upside-down stomach) with air trapped in the hernial pouch, giving rise to a pain crisis closely simulating a massive myocardial infarction. Remember that a patient with hiatal hernia, whether or not he has myocardial disease, may experience a crisis which suggests a myocardial infarction. Of course this is rather rare in the total number of hernias.

Aerophagy

I think it can be said that the most important lesions in the alimentary tract to annoy the cardiologist are hiatal hernia and aerophagy. Aerophagy commonly accompanies both angina and hiatal hernia. Anxiety because of heart disease may initiate the air-swallowing habit, and the pain of hiatal hernia may do likewise. Pressure of the large magenblase against the diaphragm may cause epigastric discomfort and, commonly, pain at the left rib margin. The latter pain may cause anxiety concerning the possibility of heart disease. Further, phrenic nerve endings may be irritated, initiating the typical phrenic pain pattern of substernal pain radiating to the neck and shoulder and down the arm. This is exceedingly difficult to differentiate from myocardial pain. Hiatal hernia itself may precipitate similar phrenic nerve pain. The large magenblase may have still another effect, quite similar to hiatal hernia. It may stimulate vagus fibers and exert a secondary effect on the already damaged myocardium, precipitating angina. Some of you will remember the statement made by Sir William Osler many years ago, that many patients with angina pectoris experienced relief after a "good burp." Reducing intragastric pressure evidently improved coronary blood flow, perhaps by elimi-

nating the stimulation of the vagus fibers.

It may be readily appreciated that in the patient with angina the concomitance of hiatal hernia and the large magenblase syndrome of aerophagy constitute a troublesome triad. The large magenblase is not unusual in the Akerlund II and III types of hernia and in the larger hernias (figures 2, 4 and 5). In the patient with angina, failure to recognize and treat concomitant hiatal hernia and aerophagy is most unfortunate.

Peptic Ulcer

Many patients have both peptic ulcer and hiatal hernia. In some patients with hiatal hernia a gastric ulcer develops high on the lesser curvature near the hiatus oesophageus which we think may actually be due to the hernia itself because of interference with the blood supply in that area, but this is an infrequent occurrence. The important interrelationship is the common occurrence of duodenal ulcer in many patients with small sliding hiatal hernia. Patients with duodenal ulcer usually have too much acid in the stomach, and when the stomach goes into rigorous contractions two or three hours after meals, reflux of acid peptic juice into the esophagus is likely to occur. The combination of the Akerlund I sliding hiatal hernia and duodenal ulcer is an unfortunate one. Reflux esophagitis, esophageal ulcer and stenosis may develop as complications of the hernia.

Duodenal ulcer and hiatal hernia are the two conditions which most commonly awaken patients night after night with epigastric or low substernal distress. This is a common manifestation of duodenal ulcer, and likewise many hiatal hernias of the sliding type cause patients to be awakened at 1 or 2 o'clock in the morning with substernal pain or pyrosis. In the case of hiatal hernia, relief often follows getting out of bed, going to the bathroom, and perhaps taking a sip or two of water. This distress caused by duodenal ulcer is not relieved so quickly, and usually it takes from 5 to 15 minutes after taking milk or an antacid preparation before the pain is relieved. Keep in mind when you see a patient who is having night distress in the substernal region or epigastrium, night after night, that the most common causes are duodenal ulcer and hiatal hernia.

The other interrelationship of great importance in respect to peptic ulcer and hiatal hernia is bleeding—massive bleeding, hematemesis or melena. Of course the physician's first thought when such a patient arrives in the hospital is always peptic ulcer, because 75 per cent of massive gastrointestinal hemorrhages are the result of bleeding from peptic ulcer. The other 25 per cent may be due to bleeding from a number of other lesions. In second place as a cause in a general city hospital are esophageal varices. Neoplasm probably is in third place. Hiatal hernia without associated neoplasm or peptic ulcer is not a common cause of massive bleeding, but a number of patients who have massive bleeding have hiatal hernia.

It is important not to assume that because hiatal hernia is known to be present the patient is of necessity bleeding from the hernia. After the hemorrhage is over, if you can wait and do not have to operate as an emergency, i.e., four or five days later, one may do a string test and see where the blood stain is on the string. If it is low in the esophagus, the hemorrhage probably was from the hiatal hernia, unless varix is present also, but if the blood stain is down on the bile-stained part of the thread the hemorrhage more likely was from a duodenal ulcer.

Gallbladder Disease

In Dunhill's series 16 per cent of the patients with gallbladder disease also had hiatal hernia, and in Morein's series the figure was 23 per cent. This interrelationship has two important facets. Biliary colic with associated vomiting is particularly deleterious in the presence of a sliding hiatal hernia. The sudden marked increase in intra-abdominal pressure is likely to worsen the hernia and may bring on an attack as a result of congestion in and around the sac. For this reason a patient with hiatal hernia who is subject to attacks of biliary colic should have cholecystectomy, in the absence of contraindications. Even more important, there are a great many

patients who have their gallbladders removed because of cholelithiasis but continue to have dyspeptic symptoms afterward. I like to say that the only symptoms one can definitely attribute to the gallbladder are those of biliary colic and its concomitants, that is, nausea and vomiting and in some instances jaundice, and that any of the other corollary dyspeptic symptoms are more likely to be due to associated disorders.

In patients with gallbladder disease the most common associated disorders are aerophagy and hiatal hernia. Therefore it is wise, I think, to indicate to the patient who is going to have cholecystectomy that symptoms such as pyrosis, bloating, gaseousness, belching, flatulence, and so on may not be relieved by operation and will require additional treatment directed toward their cause, e.g., hiatal hernia, aerophagy, or irritable colon.

Conclusion

Hiatal hernia is one of the most common abnormalities in the alimentary tract in persons over the age of 50 years. In your patients with angina pectoris or degenerative cardiovascular disease who have dyspeptic complaints, do not blame all the complaints on the heart, particularly if they are associated with pyrosis, dysphagia, postprandial distress, or distress associated with lying down. Keep in mind also that peptic ulcer disease is commonly associated with hiatal hernia. These are two very common lesions, so that often a careful analysis of symptoms is necessary to decide what proportion of the symptoms are related to the hernia and what proportion to the peptic ulcer. Certainly one does not want to do a hernia operation to relieve peptic ulcer symptoms, or send a patient to surgery for peptic ulcer if the pyrosis is the result of a hiatal hernia. One must sort out these symptoms and decide which are due to what. The other two concomitants I have mentioned, gallbladder disease and aerophagy, are very common in this same group of patients. Therefore, differential diagnosis frequently requires your thinking in terms of cardiovascular disease, hiatal hernia, air-swallowing, peptic ulcer and gallbladder disease. Often in the presence of two or more of these conditions a very careful analysis is required to decide which symptoms are most important and which lesion deserves primary therapeutic attention.

1959

INTERSTATE POSTGRADUATE MEDICAL ASSEMBLY

Nov. 2-5 Palmer House Chicago, Illinois

Drugs Most Effective in the Control of Epilepsy

In the rapidly expanding field of anticonvulsant therapy, drugs employed are classified chiefly as barbiturates, hydantoinates, oxazolidines, succinimides and pyrimidines. The special indications, contraindications and conflicts in using these drugs will be discussed, and new preparations still under investigation will be considered.

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Progress in medical and surgical therapy of neurologic diseases requires great accuracy in diagnosis. Although the clinician may identify the disease, he cannot always localize it. Therefore, clinical examination must be supplemented with special tests, such as lumbar puncture, myelography, air encephalography, angiography and electroencephalography. In assessing these methods, the author states that neurologic diagnosis is still challenging, and that the search continues for a test which will replace doubt with certainty.

Methods of Neurologic Diagnosis and Their Critical Assessment

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Two opposed, but by no means mutually exclusive, attitudes are common toward neurology, and both attitudes are unwarranted: (1) Neurology is so complex, esoteric and eponymic as to be generally incomprehensible; (2) the neurologist's preoccupation with minutiae is akin to that of the medieval schoolmen with trivia; the pragmatic view obtains that the commoner diseases are easily recognized and when the clinical approach fails, special tests will yield the answer.

Neurology comprises a corpus of knowledge which in its comprehensiveness and lucidity is without peer in the clinical sciences. It is firmly rooted in anatomy, physiology and pathology, and its accomplished practice must rest on stern disciplines. As one of the clinical sciences, its principles and practice do not differ fundamentally from those of internal medicine. The neurologist has the dual task of helping in the diagnosis and the management of complex cases, and often he has the somewhat surprising duty of pointing out to his colleagues that what appears to them as simple and in no need of further investigation appears to him to be complex and worthy of the most careful study.

The amusing myth about the poverty of neurologic therapeutics to the contrary, the important progress in both medical and surgical therapy of neurologic diseases calls for great accuracy of diagnosis, as to both the seat and type of the disease. In such diagnosis special laboratory studies have assumed great importance. They are of most value when the clinical approach has been carried to its limits; they complement and supplement rather than substitute for clinical findings. The random

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ordering of special tests here, as in the rest of medicine, is the hallmark of the uncritical; laboratory machines are of value when they are asked the right questions rather than when used as penny-in-the-slot dispensers of abracadabra.

Clinical Approach

The twin diagnostic problems that every neurologic case poses are: "Where is the lesion?" and "what is the lesion?" To answer these fully gives the anatomic site of the lesion, the pathophysiologic disturbance, and the nature of the morbid process.

The topography of the lesion is usually decided by means of the neurologic examination. The history may also help and may at times suffice; in other patients special tests alone may provide the answer. The history reveals the site of the disordered process in jacksonian epilepsy. The patient who has a twitching starting in the thumb and index finger of the right hand, followed by similar movements of the right side of the face, has, almost certainly, a lesion at the lower end of the precentral gyrus of the left hemisphere. The aura of other types of seizure has a similar localizing value; tinnitus points to a discharging process in Heschl's gyrus, and hallucinations of smell to the uncus. Similarly, a patient who complains of symmetrical numbness and weakness in the feet and hands has a lesion of the peripheral nerves.

The greater the examiner's familiarity with anatomy the greater will be his ability to localize the lesion from the neurologic signs. When the anatomic and physiologic signs are complex, rules of thumb are not to be disdained. Vertical nystagmus tends to point to a lesion of the brain stem, fasciculations more often than not to a lesion of the anterior horn cells, and truncal ataxia to a lesion of the vermis cerebelli.

The more logical approach may be exemplified by disease of the pyramidal system. This tract stretches from the motor cortex to the lower spinal cord, crossing for the most part at the medullary pyramids. A lesion anywhere in its extent will produce essentially the same disturbances in structures distal to the lesion. The actual level of the lesion has to be determined from other signs. Thus, a cortical lesion is more likely than not to paralyze the face or an arm or a leg, or to affect them in differing severities, because the cortical areas subserving their innervation are widely separated. A lesion of the internal capsule is likely to produce hemiplegia affecting face, arm and leg. A third-nerve palsy on one side, with a contralateral hemiplegia affecting face, arm and leg, points to a lesion of the midbrain. A paralysis of the face on one side, combined with a crossed hemiplegia of the arm and leg, points to a pontine lesion; a hypoglossal nerve paralysis with a crossed hemiplegia indicates a medullary lesion. A spastic paralysis of one leg associated with an inverted radial jerk on the same side points to an ipsilateral lesion of the fifth and sixth cervical segments of the cord. A spastic paralysis limited to one or both legs may point to a lesion of either the spinal cord, most likely below the cervical enlargement, or the paracentral lobule of the brain. Presence of local epilepsy in the leg indicates a cortical seat of the disease. A sensory level in the trunk, say at the level of the umbilicus, together with a motor level, as when the lower half of the rectus abdominis muscle is paralyzed and the upper half spared, would place the lesion at about the tenth thoracic segment of the cord.

The clinician occasionally knows what disease the patient has but is unable to say exactly where it is. A patient who shows papilledema and little else is likely to have an intracranial tumor. Localization, however, may be impossible except to say that it is likely to be near the midline, causing interruption of the flow of cerebrospinal fluid in the third ventricle, the cerebral aqueduct or the posterior fossa.

Pathophysiologic Diagnosis

The symptoms and signs of neurologic disease are the subjective and objective evidences, respectively, of disturbed function. This disturbance may take the form of overaction (or perverted action) of the structure concerned, or loss of its action. The chief examples of the former are the discharging lesions. In its widest connotation the discharging

lesion comprehends such diverse entities as a convulsion, tabetic pain, neuralgia, the migrainous prodrome and the hiccup; in its narrower and perhaps more useful sense it is limited to the epilepsies. "Inhibitory epilepsy" and postepileptic paralysis exemplify the second category of disturbance, the abrogation of function. Common causes are vascular disease, trauma and hypoglycemia, which interfere with the oxygen supply or the nutrition of the neurons. The loss of function may be complete, as in the cells at the center of an infarct, or partial at its periphery. It may be permanent, as when the neurons are deprived of their blood supply for more than a very short time. It may be temporary and reversible, as in Adams-Stokes disease or in the coma of alcohol or morphine poisoning.

At the simpler levels of neurologic functioning these principles apply. Thus, when a mixed peripheral nerve is cut, the muscles supplied are paralyzed, and the area innervated becomes anesthetic and remains so until the nerve fibers regenerate or compensation takes place—in the motor sphere by trick movements and in the sensory sphere by the ingrowth of fibers from neighboring areas. However, in the complex human central nervous system which has undergone progressive encephalization, destructive lesions at a higher level permit the release of functions at lower levels. These lower functional levels take time to get into operation. Therefore, the manifestations of a disease vary somewhat with the abruptness of its onset. Thus, a patient who has had a vascular accident affecting the internal capsule will manifest a flaccid hemiplegia, which, in time, progresses to a spastic hemiplegia. The patient with a cerebral tumor, gradually damaging the same area of brain, typically shows a spastic hemiplegia from the beginning.

"False localizing signs" refer to the disturbance of function at sites distant from the primary disease and occur chiefly in cases of cerebral tumor with raised intracranial pressure. Thus, in patients with papilledema, abducens nerve palsies, either unilateral or bilateral, have little localizing value. Similarly, the large pupil on the side of a subdural hematoma may result from compression of the third nerve, not by the hematoma but as a secondary effect of herniation of the temporal lobe through the incisural notch.

Pathologic Diagnosis

It may at times be possible to define the morbid process from the clinical neurologic examination. More often, however, the pathologic diagnosis comes from the history, the examination of the rest of the body, or the laboratory tests.

An example of a disease which writes its signature into the neurologic examination is tabes dorsalis. The small, irregular, unequal pupils which fail to react to light but react on accommodation, the ptosis and the compensatory wrinkling of the forehead, the ataxic gait and the positive Romberg sign, the hypotonia and the impaired deep tendon reflexes, the Charcot joint and the perforating ulcer, the characteristic analgesia (over the nose, across the chest at the nipple line, in the saddle area, along the ulnar border of the forearms and on the shins) may make the diagnosis unmistakable. Similarly, the constellation of neurologic signs may point to multiple sclerosis, pseudohypertrophic muscular dystrophy, peroneal muscular atrophy, Friedreich's ataxia, general paresis or diphtheritic neuropathy, to mention only a few.

In the pathologic diagnosis, however, the clinical history generally sheds most light. It may at times supply the complete diagnosis, as in the classic case of migraine, trigeminal neuralgia, ciliary migraine, postherpetic neuralgia and a number of others. This is not to advocate neglect of physical examination. The patient whose history suggests a writer's cramp may, in fact, show evidence of Parkinson's disease. Sensory loss in the face will at once exclude the diagnosis of trigeminal neuralgia, however typical was the history for that complaint.

Many different pathologic processes may give rise to identical signs; then the history may help in the differentiation. For example, four patients have evidence of a transverse lesion of the spinal cord. In the first a history of a fall immediately preceding its onset will

point to a traumatic etiology; in the second an acute onset out of a clear sky may suggest such entities as transverse myelitis; in a third a gradually progressive course associated with girdle pains may point to a spinal tumor; in a fourth an association with bilateral retrobulbar neuritis may indicate neuromyelitis optica.

In general, vascular lesions have a catastrophic or sudden onset, inflammatory diseases an acute or subacute onset; tumors are more likely to have a gradual onset and progressive course, and demyelinating disease is apt to relapse and remit.

Age of onset is important. Convulsions appearing in infancy are likely to have an entirely different significance from convulsions appearing for the first time in middle life. Raised intracranial pressure in a child is likely to suggest a tumor of a different type and in a different site from that occurring in an adult. Apoplexy in youth and apoplexy in old age raise different pathologic possibilities, even though both are due to vascular disease.

Nor must family history be neglected. Presenile dementia occurring in a patient whose relatives had Huntington's chorea, even though he himself has no chorea, is likely to be differently diagnosed from similar dementia occurring in the absence of a family history. An ataxia can be more confidently attributed to the spinocerebellar degenerations when there is a positive family history than when there is not. Optic atrophy occurring in a member of a family known to have the hereditary form of the disease will provide less of a mystery than when a sporadic case of the same disease is seen.

The neurologic examination cannot be divorced with safety from the general physical and mental examinations. That the patient is a diabetic or an alcoholic or has had syphilis or tuberculosis must receive due weight in assessing neurologic findings. That the patient has lived in the tropics, or worked as a painter, or has recently come in conflict with the law, or has sustained a compensable injury, may open up the diagnostic possibilities. An adenoma sebaceum may be the key that tuberous sclerosis is the explanation of an otherwise obscure case of mental defect and convulsions. A port-wine stain on the face may immediately illumine the otherwise unlikely combination of glaucoma, hemiplegia and seizures. Molluscum fibrosum or café-au-lait spots in the skin may have a definite bearing in assessing a spinal compression, an optic atrophy, raised intracranial pressure, or bilateral nerve deafness. A fading rash in a patient with the clinical picture of encephalomyelitis will at once raise the possibility of acute perivascular myelinoclasis. Edema and redness of the skin of the face, or indeed of the whole body, in a patient who has difficulty in swallowing and weakness of the proximal limb muscles may point to a dermatomyositis. A pale, dry, wrinkled skin with loss of sexual hair may suggest a chromophobe adenoma of the pituitary as the cause of impaired vision.

Examination of the heart may reveal a source of emboli, and the blood pressure may point to an encephalopathy being hypertensive. In a patient with raised intracranial tension it may be important to establish whether a concomitant high blood pressure is its result or its cause; a compensatory hypertension is likely to be of recent origin and unassociated with a heaving, outwardly displaced apex beat.

The lung may reveal disease intimately connected with the neurologic disturbance. Empyema, bronchiectasis or a pulmonary abscess may suggest that a space-occupying lesion in the brain is a metastatic abscess. No investigation for cerebral tumor is complete without a chest x-ray to check for possible primary new growth there. X-ray examination of the lung may yield evidence which clinches the tentative neurologic diagnosis of sarcoidosis.

Disturbances of the eyes and ears are of so frequent neurologic relevance that examination of these organs is routine.

The simpler laboratory tests have the same value to the neurologist as to the internist. The Wassermann reaction of the blood, like the urine examination, is a routine procedure. It is unnecessary to labor the value of the other blood and chemical studies when indicated.

Mental Assessment

Like the internist, the neurologist is often confronted with psychosomatic and functional

disease. Serious errors may ensue from a wrong diagnosis in either direction. Hysteria masquerading as a neurologic disorder can present a difficult diagnostic problem; conversely, such organic diseases as paralysis agitans and temporal lobe epilepsy are frequently mistaken for psychoneuroses, at least in their early stages.

Functional disease must be diagnosed in its own right rather than because nothing can be found physically wrong. The diagnosis is irrefragable if the following four criteria are satisfied: (1) The symptoms have a functional ring; (2) there is no relevant organic disease; (3) an adequate psychogenesis can be elicited; and (4) the symptoms can be cured psychologically. None of these four canons is, in itself, adequate for a secure diagnosis. Organic tremors, for example, are often worse when the patient is under stress and can be helped by putting him at ease. There must be few people in whom the pertinacious inquirer after truth cannot establish emotion-laden complexes which can only too easily be given a spurious relevance. Bizarreness of symptomatology is often a matter of the interpreter's experience; anyone unaware of the significance of Lhermitte's sign, which is sometimes described as "water trickling down the spine," might easily attribute it to an overactive imagination, whereas the sign has a completely organic basis.

Limitations of the Clinical Approach

However valuable the clinical approach, it does not permit accurate diagnosis in all cases. A tumor in the frontal lobe may simulate one in the cerebellum and vice versa. All cases of polyneuritis have a family resemblance and by and large are easily diagnosed. However, the condition has a diversity of causes, the exact one often being difficult to determine. The muscles of the hand may waste from a multiplicity of causes and the clinical examination does not always disclose which one. If rational therapy is to be applied, the progressive paraplegias of middle life require greater differentiation as to their type than is always possible by clinical means. The common diagnosis of idiopathic epilepsy when there are seizures of late onset is usually unjustified and dangerous, even when careful physical examination has revealed nothing of note. Experience teaches that migrainous headaches which always involve the same side of the head may ultimately prove to be associated with a berry aneurysm or an angioma, even when clinical signs may presently draw a blank. Subdural hematomas are great mimics and the diagnosis cannot always be excluded on purely clinical grounds. The first symptoms of metastatic tumor in the brain may bear every clinical resemblance to a vascular accident.

The neurologist is only too frequently aware that his clinical diagnosis is a statistical assessment; he knows that common things commonly occur, but he knows also that a hoopoe may occasionally be mistaken for a sparrow. For these reasons, the neurologist turns hopefully to the special tests.

Ancillary Methods

The clinician is probably in the best position to assess contributions from the various ancillary services, for specialists of whatever sort are apt to resemble the tanner who believes there is nothing like leather. Uncritical acceptance of laboratory tests is responsible for part, at least, of the plethora of useless investigations; conversely, failure to recognize special contributions which the laboratory can make may handicap therapy. On the whole, however, far more patients are overinvestigated than underinvestigated. For these reasons, a forthright and judicial statement on the value of special tests from the clinician's viewpoint appears merited.

It seems a sound starting proposition that when it is not necessary to do something which is expensive or potentially dangerous, it is necessary *not* to do it. The advantages of a procedure must outweigh its disadvantages, as far as these can be weighed.

The special tests to be considered are lumbar puncture, myelography, air encephalography, angiography and electroencephalography. None of these tests is entirely bland and benign, except electroencephalography, and then only if potentially dangerous activating technics are not used. Lumbar puncture occu-

pies a separate category as a test which is routinely carried out in the general wards of hospitals or in the home. Of such "routine" tests, it is probably the one which causes the most pain, discomfort and anxiety to patients. In certain parts of the country a phobia attaches to it. The minor headaches and backaches which follow it are well known; less well known are the occasional meningitides, cranial nerve palsies, or even subdural hematomas. In the presence of papilledema, lumbar puncture is a dangerous procedure, as death may result from brain herniation through the incisural notch or foramen magnum. To carry out the Queckenstedt test in the presence of raised intracranial pressure is particularly culpable. Compression signs of a spinal tumor may be exacerbated by a lumbar puncture.

The severe headaches associated with pneumoencephalography are replaced by countervailing disadvantages when this procedure is carried out under anesthesia. The complications and occasional deaths which follow angiography are not widely canvassed. Ventriculography may aggravate the symptoms of the brain tumor it seeks to localize and immediate surgical intervention may be required.

For these reasons, before carrying out any of these tests, it is important to ask the following questions: Is this test, if results are either positive or negative, likely to add any useful information? Does the information, if useful, merely confirm the clinical evidence or supplement it? If the clinical evidence points unequivocally, for example, to hysteria, any of the tests carried out must be regarded as unnecessary. If the patient has a demonstrated carcinoma of the lung and, in addition, signs of a tumor in the brain, the majority of clinicians would probably contend that no attempt should be made to remove the brain tumor, and therefore any effort to localize it by special tests would be unnecessary. In a classic case of multiple sclerosis, many clinicians would consider a lumbar tap carried out to determine the colloidal gold reaction as a work of supererogation; those who believe that lumbar puncture can have an adverse effect on the demyelinating process would condemn it outright.

When special tests merely confirm clinical findings, the frequency of their use will depend on the clinical confidence of the physician. In a typical case of migraine, the demonstration of slow waves from the occipital area during an attack will not add materially to the diagnosis, although it is of the greatest interest to the investigator seeking to confirm or refute the theories of the pathogenesis of this disease. Likewise, in the aforementioned patient with jacksonian epilepsy starting in the thumb and index finger and spreading to the mouth, the EEG finding of sharp waves at the lower end of the precentral gyrus adds nothing new. The presence there of high-amplitude slow waves, by suggesting a space-occupying lesion for which there was no clinical evidence, would have supplementary usefulness.

Special Tests

Lumbar puncture—The usefulness of this test ranges from the absolute to the negligible, depending on the problem at issue. Generally the diagnosis of meningitis is made on clinical grounds. We are usually dependent, however, on the examination of the cerebrospinal fluid to tell what organism is involved. True, the presence of a purpuric rash may suggest a meningococcal infection, or choroidal tubercles on funduscopic examination may point to a tuberculous infection, but to omit examining the cerebrospinal fluid under these circumstances would be irresponsible. It should be added that the certain diagnosis of tuberculous meningitis depends not on changes in the chloride or sugar content of the cerebrospinal fluid, but on the finding of *Mycobacterium tuberculosis*, and the frequency with which it is found varies with the assiduity of the search. Only an examination of the cerebrospinal fluid will allow confident differentiation between a meningitis and a meningism. Since the introduction of the sulfonamides and the antibiotics, the common and sometimes inculpable habit of treating a fever before diagnosing its cause can mask the classic signs of a meningitis so that it may present, for example, as a focal epilepsy. In such a case, the presence of pus in the cerebrospinal fluid may come as a

surprise, and the impossibility of diagnosing the causative organism and instituting specific therapy should serve as a caution or rebuke, depending on the circumstance. A slowly leaking subarachnoid hemorrhage may, at times, masquerade as a meningitis, or a fulminating meningitis may occasionally suggest a ruptured aneurysm. In the absence of such collateral evidence as a subhyaloid hemorrhage favoring bleeding, and an inflamed ear favoring infection, the lumbar puncture alone may establish the diagnosis.

The slight or moderate increase of cells in the cerebrospinal fluid, together with the changes in its chemical content, may not of themselves permit differentiation between a viral encephalitis, a brain abscess, a cortical thrombophlebitis, an acute disseminated encephalomyelitis, a tumor impinging on the cerebrospinal fluid pathways, or a sarcoidosis of the central nervous system. A lumbar tap early in the course of poliomyelitis may reveal no increase of cells. The introduction of foreign bodies into the subarachnoid space, as in air encephalography, may produce a transient pleocytosis.

The differentiation of a cerebral thrombosis from a hemorrhage is often notoriously difficult; however, the presence of blood or its products of disintegration in the cerebrospinal fluid will allow the distinction. The popular fallacy that blood in the cerebrospinal fluid is part of the picture of uncomplicated subdural hematomas must be exploded.

A positive Wassermann reaction in the spinal fluid, together with a pleocytosis, increased globulin and protein content, and a paretic colloidal gold reaction, almost permits the diagnosis of general paresis from the lumbar tap alone; but all these positive findings are not invariably found together. A completely normal spinal fluid is compatible with the diagnosis of tabes dorsalis. A paretic colloidal gold reaction (with a negative Wassermann reaction) may permit the diagnosis of multiple sclerosis when this disorder has to be differentiated from the myelopathy of cervical spondylosis. But a paretic curve may also occur in nonsyphilitic subjects in other diseases than multiple sclerosis, such as sarcoidosis of the nervous system and the encephalitis associated with acute specific fevers.

In unskilled hands the organisms of a torula meningitis may be mistaken for white blood cells. In skilled hands malignant cells may be detected. The cerebrospinal fluid sugar may be low when there is a spinal fluid pleocytosis from causes other than infectious disease.

Electroencephalography—The value of this tool in research has been great; its usefulness clinically, though undisputed, is more circumscribed. Only in the epilepsies can it be said to yield information of a type that cannot be ascertained from the clinical examination and other special tests. As in all types of inquiry, the amount of information gleaned will vary with the skill, pertinacity and ingenuity of the examiner. Many of the disturbances of the brain susceptible to recording are episodic, so that, generally speaking, the longer the record the more chance of picking up such abnormalities. The skilled use of activating technics, such as hyperventilation and sleep induction and photic stimulation, will hasten and enhance the possibilities of finding disturbances.

In epilepsy, the problem the clinician puts to the electroencephalographer is whether it is the so-called idiopathic type or secondary to an insult to the brain; and if damage exists, where is it? If three per second, bilaterally synchronous spike and wave discharges can be demonstrated, the clinician can rest assured that he need not further pursue investigations for serious organic disease; it may also point up to him that the oxazolidine-2, 4-dione derivatives may have a specific therapeutic effect. It is especially important when surgery is contemplated to know whether the brain damage is localized or widespread. As a gauge of improvement, there is not always a close correlation between the clinical and electroencephalographic status.

In cases in which clinical evidence is sufficient to indicate the likelihood of a tumor but insufficient to lateralize or localize it, the EEG may do both. It is not within the competence of the machine to tell the nature of a tumor; the amount of slowing of the waves, however, may indicate the acuteness of the space-occupying lesion and by that means hint at its

nature. It may also confirm a lesion otherwise in doubt; it may reveal the presence and position of an otherwise unsuspected metastatic tumor in the brain of a patient with a primary lung carcinoma. Occasionally the type of dysrhythmia may be fairly characteristic for a specific disease, as in the case of subacute sclerosing encephalitis.

Radiology—Plain x-rays—Some physicians order plain x-rays of the skull in patients with suspected neurologic disease almost as often as they order chest x-rays when lung disease is suspected. The information yielded in these two instances is not comparable; the lung itself can be visualized but not the brain unless there is calcification. Conclusions must be drawn for the most part from changes in the skull. Where trauma is involved, x-rays are imperative for medicolegal reasons, even though there is little correlation between the presence or absence of fractures and the seriousness of the damage to the brain. A fracture involving the groove of the middle meningeal artery may, however, have more precise value in supporting the diagnosis of an extradural hemorrhage.

In cases of suspected tumor or other space-occupying lesions, such as subdural hematomas, a calcified and shifted pineal gland may strengthen the diagnosis, as may a similar shift in a calcified falx or choroid plexus. A tumor may itself be calcified or it may produce erosion or hyperostosis of adjoining bone. An acoustic neuroma may be seen on suitable views to excavate the internal auditory meatus; a glioma of the optic nerve may enlarge its optic foramen; and a chromophobe adenoma may produce characteristic ballooning of the pituitary fossa, while the eosinophil adenoma produces additional changes in the skull and jaws. The plain x-rays may localize and even go far in identifying the type of tumor. A completely normal skull x-ray is, of course, not incompatible with a brain tumor. Erosion of the dorsum sellae, or in a young person separation of the sutures, will provide evidence of raised intracranial pressure.

In vascular disease x-ray of the skull also has a sphere of usefulness. Vascular calcification may occur in arteriosclerosis; aneurysms may show an arc of calcification in their walls; a chronic subdural hematoma may show plaques of calcification around it; in the Sturge-Weber syndrome "tramline calcification" may be in evidence. A retro-orbital aneurysm may erode the margin of the optic foramen or the sphenoidal bones at the upper end of the orbital fissure. The radiologist may also help in the diagnosis of toxoplasmosis or tuberous sclerosis, both of which are often characterized by nodules of calcification.

The help from competently executed and interpreted x-rays must be set against the countervailing errors and dangers ensuing from attaching pathologic significance to the many and varied deviations from the normal which have no clinical significance. The field of neuroradiology has grown rapidly and is attracting its own specialists. Here, as elsewhere, there is a wide gulf between the expert and the average.

Roentgenography of the spine is of great importance to the neurologist. In little more than a decade the condition formerly called cervical osteoarthritis, considered of little clinical significance, has blossomed, under the new name of cervical spondylosis, into the most common cause of myelopathy in the second half of life. It also has been incriminated in sensory and motor disturbances of the neck and of the limbs, and it has been found to underlie some cases diagnosed as diversely as frozen shoulder, subarachnoid bursitis, atypical coronary artery disease, and carpal tunnel syndrome. Unfortunately, the severities of the radiologic findings and the neurologic disorder in cervical spondylosis are not closely correlated.

In recent years the importance and relative frequency of diseases at the junction of the spine and skull, such as platybasia, occipitalization of the atlas and fracture of the odontoid, have been increasingly recognized. They have been found to explain cases of so-called degenerative spinal cord disease and of atypical multiple sclerosis and primary lateral sclerosis. On the other hand, the neurologic significance of such conditions as cervical rib and spondylolisthesis has waned. It need hard-

ly be added that radiologic changes elsewhere in the body, for example, in the lung, the pelvis or the elbow, may have great neurologic importance.

Air encephalography—When air is introduced by the lumbar route, a pneumoencephalogram is obtained; when it is introduced directly into the lateral ventricles through bur holes in the skull, a ventriculogram results. The former procedure is generally preferable as being simpler and yielding more information, since it allows the air to pass over the surface of the brain and into the various subarachnoid cisterns as well as into the ventricles. However, it entails considerable risk in the very condition in which air encephalography is likely to be of most value—a cerebral tumor—for it has all the dangers inherent in lumbar puncture. Not that ventriculography is entirely safe in these cases either; a tumor of the posterior fossa may cause upward herniation of the cerebellum through the incisural notch as the result of the ventricular tap. However, the surgeon is at hand to deal with this emergency.

Even when the tumor has been confidently localized on clinical or electroencephalographic grounds, or by means of plain x-rays, air studies are still valuable in outlining its extent, which is often much greater than the area with whose function it interferes. Although the principles of localizing a tumor by air encephalography are relatively simple, sometimes it is not easy to distinguish an expanding lesion in one hemisphere from an atrophic lesion in the other.

However valuable air studies are in demonstrating an expanding or atrophic lesion of the brain, they do not often tell much of the actual nature of the lesion. A combination of abnormalities, such as ventricular compression and shift toward the opposite side combined with inability of the air to pass over the hemisphere on the same side, may raise the strong possibility of a subdural hematoma. Likewise, the presumption is strong, when a tumor is demonstrated in the third ventricle near the foramen of Monro, that a colloid cyst is involved because there is no other likely lesion in that position. To demonstrate cortical atrophy in a case of dementia, is not to continue the diagnosis very much farther, for there are many conditions which may produce both. Demonstration of several filling defects may suggest that the lesions are metastatic.

Angiography—This technic has added a further dimension to neurology. With its aid, occlusion of the internal carotid artery, a disease anticipated by Ramsay Hunt in 1914, was firmly defined by Moniz in 1937. The accurate localization of berry aneurysms has opened new possibilities for their surgical cure. Angiography has shown that angiomas are responsible for a larger percentage of subarachnoid hemorrhages than had been formerly thought. The accurate identification of an anterior choroidal artery by its means may ease the task of the neurosurgeon seeking to treat Parkinson's disease by ligating that vessel. It has also opened up new possibilities in the treatment of cerebrovascular disease; attempts are already being made to replace damaged blood vessels, and intracerebral hematomas now invite less conservative therapy than in the past.

In the diagnosis of diseases of the blood vessels, with the possible exception of hematomas, angiography is obviously preferable to air studies. However, the respective merits of the two technics in the investigation of tumors are less easily decided and will depend on the preferences and experience of the physician concerned. In lateralizing a tumor, air encephalography is usually preferable; in localizing a tumor in a known hemisphere, angiography has the merit that it will give additional clues as to the tumor type. Often the two studies complement each other.

Myelography—A wisely critical attitude to this much-abused test seems to be on the increase. The frequency with which patients with functional backaches forget the reason that led to their spinogram and fasten on it as the cause of their subsequent pain has led to a certain caution in its use "just to make sure that no organic disease is present."

Increasing conservatism in the treatment of disk disease has brought, as a corollary, the view that the accurate outlining of a herniated disk that is not to be operated on smacks of

the academic. Demonstration of an apparent spinal block or an appearance suggestive of arachnoiditis, when the test is done within a few days of another lumbar puncture, only too frequently fails to suggest to the unskilled that the injection may be subdural. The beguiling hope that myelography will always differentiate a transverse myelitis from an acute compression of the cord may turn to bemusement when it demonstrates a block, yet the surgeon fails to find any cause of extramedullary compression. The myelogram may fail to reveal a lesion within its competence because of the clinical failure to realize that a sensory level, for example, may be due to a lesion at a very much higher level than the apparent segment of involvement. Once again the machine has been asked a wrong question.

Conclusions

Advances in the methods of neurologic diagnosis have been substantial. Each new advance, however, seems to pose new problems and each new window to open up fresh vistas of ignorance.

The clinical examination remains of fundamental importance. Special tests, wisely used, supplement and complement that examination. Only too often, however, the cases that are puzzling to the clinician are equally bewildering to the radiologist and the electroencephalographer. Search continues for the special test that will replace clinical doubt by certainty.

Despite all our advances, the challenge of accurate diagnosis remains. Experience continues to be fallacious and judgment difficult.

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Practical Aspects of the Diseases of the Pituitary Body

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Workers in the fundamental sciences have successfully produced a number of hormones from the anterior pituitary body. The value of these hormones in diagnosis and therapy will be discussed. The present status of hypophysectomy in treating conditions such as inoperable malignant lesions, diabetic retinopathy and severe exophthalmos as well as those situations in which irradiation is advisable will be considered. Current success in substituting hormones from the other endocrine glands in the presence of pituitary insufficiency will be evaluated.

Indications for Cardiac Surgery

ORMAND C. JULIAN*

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Determination of the operability of cardiac lesions requires the teamwork of the cardiologist, physiologist and surgeon, and the final decision depends on a balance between the prognosis without surgery and the risk of the operative procedure. The risk of surgery also must be considered in the light of the completeness of normal function which may be expected if the procedure is successful. All these factors except prognosis without surgery are changing rapidly. Indications for specific lesions of both congenital and acquired origins are discussed, and some predictions are made for the future.

ORMAND C. JULIAN

SELECTION of patients for cardiac surgery is a serious matter. An operation on the heart subjects the patient to a significant risk of dying, and one must be very sure the expected gains are worth it. One must balance the danger of the procedure against the prognosis without it. The danger of the procedure is a constantly changing factor and is not the same at the same time everywhere. Consequently the indications for surgery at our institution differ somewhat from those here in Cleveland or those in Minneapolis. The decision must be based not only on how dangerous the procedure is in an over-all sense throughout the country but also on the skill and experience of the surgical group being considered.

Coarctation of the Aorta

Some procedures have become so standard as to be employed simply on the indication of the presence of certain conditions. Coarctation of the aorta should be repaired when it is diagnosed. The reasons are quite clear. The effect of strain on the left side of the heart, the possibility of dissecting aneurysm, and the long-term ischemia of the lower extremities during exercise make repair mandatory. We believe coarctation of the aorta should be repaired between the ages of 9 and 12 years, if the age can be selected; it should be repaired earlier in the presence of heart-failure, or later if the diagnosis is not made until later.

Patent Ductus Arteriosus

A patent ductus also should be repaired simply on the indication of its presence. This

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is best done between the ages of 3 and 15 years. Under certain circumstances the defect should be repaired earlier, and it may be repaired at any age on late discovery. A patent ductus arteriosus produces its serious effect by increasing the flow of blood through the pulmonary system. Throughout the patient's lifetime a large amount of blood may flow from the aorta into the pulmonary artery, producing changes in the pulmonary circulation and, in time, increased resistance in the pulmonary circuit which can be devastating.

Diagnosis of patent ductus arteriosus depends primarily on the finding of a continuous murmur. There are other conditions that produce the same characteristic continuous murmur, and diagnosis must be aided in many cases by catheterization. Some years ago we were not as aware as we are today of the other relatively rare lesions which produce a murmur seemingly characteristic of patent ductus arteriosus. The most significant and important differential diagnostic point is between patent ductus arteriosus and aortopulmonary window. Aortopulmonary window is a defect in the walls of the ascending aorta and the common pulmonary artery. There is a communication immediately above the base of the heart with tremendous flow from the aorta into the pulmonary system. Recognition of this lesion is very important and can be done accurately only by means of catheterization. Repair of the lesion is essential, because it produces a larger flow into the pulmonary circuit than does a patent ductus arteriosus and therefore there is more danger of the development of pulmonary hypertension and subsequent disaster.

Pulmonary Stenosis

Unlike coarctation of the aorta, patent ductus arteriosus, symptomatic anomalies of the aortic arch, and tetralogy of Fallot, pulmonary stenosis is not a lesion which should be repaired simply on the indication of its presence. Not all instances of pulmonary stenosis are significant dynamically. It is important to avoid surgery in cases in which the stenosis is simply adequate to produce a murmur and not severe enough to produce during systole a significant difference in pressure between the right ventricle and the pulmonary artery. Operation should be done in a case of pulmonary stenosis when there is cyanosis due to the presence of an associated defect in the interatrial septum. It should be done when there are true symptoms. The earliest symptom of pulmonary stenosis usually is fatigue, and the presence of true fatigability is an indication for repair of the lesion. If the right ventricular pressure on catheterization is more than 80, repair should be done. Changes in the electrocardiogram indicating enlargement or strain of the right ventricle are a distinct indication, and one of the common reasons for operating on a patient with pulmonary stenosis in infancy is the onset of cardiac failure.

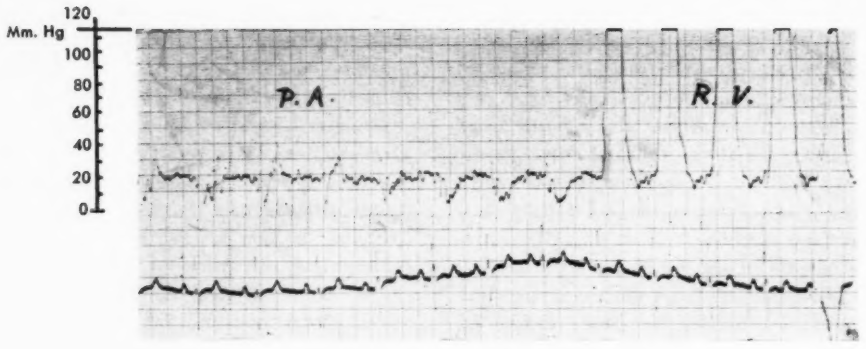
In the repair of pulmonary stenosis in our clinic we use hypothermia and inflow occlusion of the superior and inferior venae cavae, lasting long enough for the pulmonary artery to be opened, the valve incised, and the pulmonary artery sutured. The occlusion lasts some three to six minutes for this procedure without damage to the patient.

Figure 1 shows the pressure curve before and after surgery. The catheterization data, which were distinctly abnormal before surgery, are reversed afterward, so that the right ventricular pressure and the pulmonary arterial pressure are equal in systole. Anything less than this kind of result is unsatisfactory and reoperation must be done.

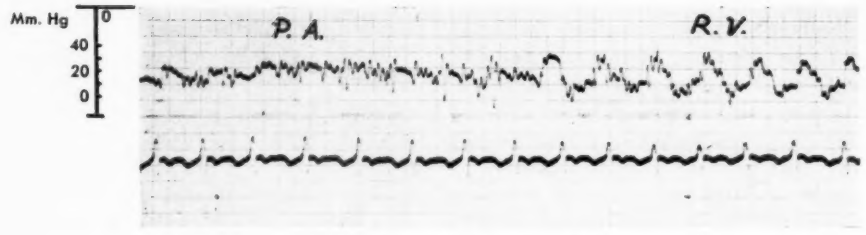
The results of pulmonic valvulotomy in patients with pulmonary stenosis are quite adequate. In one of our cases, a patient who also had pulmonary tuberculosis, it is interesting that after pulmonary valvulotomy there was an improvement in the healing of the tuberculosis; at the same time the heart, which had been enlarged, began to diminish in size.

Atrial Septal Defect

Atrial septal defect is a controversial lesion at present. At some centers it is urged that it should belong in the group of lesions in which repair is indicated on diagnosis. Other workers say it should be repaired only when there is a significant reason for doing so. The defect produces a shunt from the left side of the



Before valvulotomy



Six months after valvulotomy

FIGURE 1. Following pulmonic valvulotomy for pulmonary stenosis, the right ventricular pressure and the pulmonary arterial pressure are equal in systole.

heart into the right side, resulting in an increase in pulmonary flow and changes in the pulmonary arterial tree which may be very dangerous. The lesion should be repaired, we believe, if there are true subjective symptoms. Many times in cardiac diagnosis this is a difficult evaluation, because a patient who knows he has a murmur may develop symptoms on the basis of this knowledge rather than on the basis of any dynamic effect of the lesion. However, the true nature of the symptoms can be ferreted out, and if true subjective symptoms are present an atrial septal defect should be closed. Any degree of hypertension in the pulmonary arterial system is an immediate and serious indication for surgery, and we believe that if the left-to-right shunt is equal to the systemic output of the heart the shunt should be closed.

Atrial septal defects are closed using the heart-lung machine, because almost always it is necessary to suture a graft into the defect. Time is not available for introduction of such a patch when hypothermia is employed. Figures 2 and 3 represent a case which illustrates the effectiveness of closure of such a defect. The left-to-right shunt is indicated by the tremendous pulmonary arterial dilatation and development. After surgery the pulmonary artery is smaller, the patient's symptoms have disappeared, and the heart size has diminished almost to normal.

Interventricular Septal Defect

Interventricular septal defect presents a problem in the decision as to the applicability of surgery. A small interventricular septal defect may produce a tremendous noise, a systolic murmur in the third and fourth left interspaces, without any demonstrable strain on the right ventricle or very much left-to-right shunt. This is Roger's disease, a small inter-

FIGURE 2. Roentgenogram before surgery for atrial septal defect shows left-to-right shunt, indicated by tremendous pulmonary arterial dilatation and development.

FIGURE 3 (same case as figure 2). Three months after surgery, the pulmonary artery is smaller and heart size has diminished almost to normal.

ventricular septal defect without changes in the cardiac contour, and is not, in our opinion, a lesion which should be repaired. To be sure, in repairing such lesions a day-to-day mortality rate in the operating room and during the postoperative course of less than 1 per cent may well be attained, but these patients, if left alone, will have essentially normal lives. However, when the diagnosis of interventricular septal defect is made, catheterization is necessary to establish that the absence of evidence of heart strain on the electrocardiogram and the x-ray actually means the shunt is not very great. If the shunt is large, even if the heart is small and there is little or no electrocardiographic change, we believe the defect should be closed. If the left-to-right shunt goes on for a long period, the increased flow in the pulmonary circuit can cause the changes in the pulmonary arteries that I mentioned in relation to patent ductus arteriosus and atrial septal defect and thereby produce pulmonary hypertension and disaster for the patient.

The specific indications for repair of ventricular septal defect differ for various age groups. Repair of a ventricular septal defect using the heart-lung machine in a patient less than two years of age presents a dangerous operative situation. Therefore the only indication for repair at this age is unresponsiveness of the heart-failure to medical treatment. From two to six years of age any of the lesser degrees of heart-failure (even though they may be overcome by medical treatment), development of cardiac enlargement, and failure of the patient to develop normally in stature and weight are indications for repair. After the age of two years, interventricular septal defects can be repaired today with a mortality rate of approximately 4 per cent. After the age of six years we begin to look for the possible development of pulmonary hypertension as an added indication for surgery. Any degree of increase in pulmonary arterial pressure is an indication for surgery. It is also, unfortunately, an indication that operation should have been done earlier.

Tetralogy of Fallot

Tetralogy of Fallot appears to be an indication for repair on diagnosis. This is not because pulmonary hypertension may develop; it does not. Blood flow through the lungs is diminished rather than increased. It is not typical for heart-failure to develop in a patient with tetralogy of Fallot, because the flow of blood from the two sides of the heart is fairly well balanced. Cardiomegaly does not occur. There is, of course, right ventricular hypertrophy. Repair is therefore not based on cardiac enlargement. We repair these lesions on diagnosis because various complications occur having to do principally with the markedly elevated hemoglobin level. These patients with a hematocrit of 70 and correspondingly high hemoglobin levels are subject to thrombosis of cerebral vessels and pulmonary arteries and thus cannot expect to have a comfortable and productive life. Another reason for repair, of course, is the cyanosis, which is itself an indication for surgery.

Acquired Heart Disease

The surgical treatment of acquired heart disease is taking on a new complexion as a result of the introduction of open-heart surgery. Mitral valve surgery now does not consist simply of commissurotomy for mitral stenosis. We are not limited to external blind manipulations to repair regurgitation, operations that never really worked well anyway. We are able, under direct vision, using the heart-lung machine, to enter the heart and repair the regurgitant valve in cases in which the damage has not made it irreparable.

We believe that commissurotomy in the presence of mitral stenosis still should be done as a blind procedure in most cases, even though we can go into the heart. We think that commissurotomy is indicated in patients who are in class 3 of cardiac competence; that is the prime indication. Patients in class 2 may electively be subjected to commissurotomy. Those in class 4 (patients who are uncomfortable even at bed rest) may be operated on, because we think the occasional excellent results warrant the effort and risk.

Blind mitral commissurotomy is contraindicated in patients who have a significant associated mitral regurgitation. Patients who have a significant apical systolic murmur or enlargement of the left ventricle cannot be operated on simply by commissurotomy as we have known it. Aortic regurgitation which is productive of a diastolic blood pressure below 50 mm. Hg is a primary contraindication to mitral stenosis surgery. Other contraindications are active rheumatic fever, low pressure, and low-flow state. Some patients who have mitral stenosis also have such a significant degree of damage to the myocardium that the mitral valvular obstruction is insignificant by comparison. These can be ferreted out only through the use of catheterization, which discloses that in spite of the mitral valvular obstruction the pulmonary arterial pressure remains low.

There are certain conditions which are not contraindications to commissurotomy. If the diastolic pressure in the presence of aortic regurgitation is more than 50 mm. Hg, the patient may be operated on with anticipation of good results. Age alone is not a contraindication. Tricuspid regurgitation is not a contraindication. Tricuspid stenosis and aortic stenosis are not contraindications, only because they are repaired at the same time. Pregnancy has not proved to be a contraindication. Atrial fibrillation and peripheral arterial emboli do not disturb the surgeon or the results.

Actually the selection of patients for mitral valvular surgery in the presence of stenosis can be brought down to one simple fact: The lesions which make for poor results of commissurotomy are those which produce enlargement of the left side of the heart, aortic regurgitation and mitral regurgitation.

In a series of cases in which mitral commissurotomy was performed, interpretation of electrocardiograms and x-rays in the light of the presence or absence of enlargement of the left side of the heart disclosed that excellent results were obtained in 14 patients with enlargement, and poor results in 21. Only three of 91 patients without enlargement had poor results. This one fact has become almost a

rule of thumb in our selection of patients for mitral commissurotomy.

Open-heart commissurotomy using the heart-lung machine is indicated in certain situations. First we think it is indicated in reoperation. It is indicated when clots are present in the left atrium, when there is a significant degree of mitral insufficiency, or, in certain cases, when there is a great deal of tricuspid regurgitation.

In the case of a 32 year old patient who preoperatively exhibited the changes in contour typical of mitral stenosis, clots were noted in the left atrium at exploration, and instead of going on through the clot-filled left atrium with the finger we elected to postpone surgery and operated using the pump. Another patient had mitral incompetence and tricuspid incompetence, and we operated in a different manner. Using an approach through the right atrium, the tricuspid valve was exposed. The interatrial septum was then incised, the mitral valve was exposed, and the mitral valve was repaired first. The mitral valve was widely dilated, totally incompetent, and by putting sutures bolstered by little plastic sponge grafts into the annulus we could reduce the size of the orifice to normal; after this procedure, the mitral leaflet could reach across the valve. The interatrial septal incision was then closed with a suture line. The tricuspid valve, also incompetent, was repaired in much the same way, putting these little sutures at the annulus and reducing its size so that the leaflets, not diseased at all, could coapt and the regurgitation could be overcome. The patient did not have to wait months for the right side of his heart to shrink so that the tricuspid valve would quit leaking. Immediately after surgery the tricuspid valve was of small size, so the lung field cleared.

There is no doubt that we are limited in the ability to repair the damage produced by any form of disease in the valves of the heart or in the myocardium. In acquired disease we are limited in the approach to these problems by the extent of the damage, calcification, fibrosis and loss of substance. There is no doubt that the answer lies in the use of prostheses to replace valves and that in the very near future this will be a successful form of treatment. Prostheses, of courses, cannot be used for the motor, the muscle. The only answer here will be a new motor, a new muscle—therefore a new heart—and I believe we all know this has been done in the laboratory many times and can be done without difficulty; the new heart survives, however, only about 48 hours on the average. We are so close to this satisfactory answer, cardiac transplantation, and so baffled by the reaction of the recipient, that the breakthrough will come as a shock and will leave every one of us unprepared. I envision the time when a new heart will be at a real premium and certainly a difficult problem in a civilization that trades in its cars every year.

Diffuse pulmonary fibrosis may have many different causes. When roentgenographic examination reveals evidence of this disease, a detailed history should be obtained and a careful physical examination performed. Extensive laboratory procedures often are necessary. Prognosis and treatment depend on the underlying cause and on complications.

Diffuse Pulmonary Fibrosis

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In cases of diffuse pulmonary fibrosis, symptoms may be absent or mild, or there may be severe dyspnea, cyanosis, cough and sputum, while the roentgenographic examination of the chest may reveal bilateral diffuse infiltration. Since this clinical picture may be caused by many pathologic conditions, it often is difficult to draw any definite conclusion regarding the etiologic factors. In an article published in 1948, Felson and Heublein[1] listed 75 different causes of diffuse pulmonary fibrosis. Subsequently, several other causes, including silo-filler's disease, pneumoconiosis due to diatomaceous earth, and berylliosis, have been added (table 1).

The Case History

Since roentgenograms of the chest are similar in cases of different diseases which may cause diffuse pulmonary fibrosis, it is clear that roentgenographic examination of the chest may be of limited value in the differential diagnosis. A carefully taken history is vital. John Benjamin Murphy once said, "Listen, listen to the patient's story! He is telling you the diagnosis." This is often true in cases of diffuse pulmonary fibrosis. The history should include what the patient has done since leaving school and all areas of residence. It also should be precise. The statement that the patient worked in an automobile factory means very little. Further questioning may reveal that his work in the factory involved exposure to silica dust in a fine oil spray, which would explain the cause of the fibrosis. The occurrence of pertussis in childhood plus a long history of cough, sputum and recurrent pneumonia should point to bronchiectasis as a possible cause. The same may be said of a history of intensive irradiation of the chest in a case of a malignant lesion.

A history of ingestion of mineral oil may suggest that the fibrosis is due to lipid pneumonia. If the patient is a farmer who became ill after working in a silo, the cause of the fibrosis may be silo-filler's disease. Berylliosis may be the cause if the patient has broken a

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TABLE 1

Classification of Diffuse Pulmonary Lesions*

1. CYSTIC LESIONS
   a. *Congenital cystic disease*
   b. Pulmonary pneumatocele (Peirce and Dirkse)
   c. Neurocutaneous syndromes (tuberous sclerosis)

2. ASPIRATION
   a. *Hemorrhage*
   b. Drowning
   c. *Lipid pneumonia*
   d. Changes secondary to achalasia or a malignant lesion of the esophagus
   e. Foreign bodies

3. INHALATION—PULMONARY EDEMA
   A.
      a. Acetylene
      b. Beryllium
      c. Carbon tetrachloride
      d. Kerosene
      e. Nitric acid
      f. Phosgene
      g. Silo-filler's disease (NO_2)
   B. Dust—Pneumoconiosis
      a. *Anthracosis* (coal dust)
      b. *Bagassosis* (bagasse)
      c. Baritosis (baryta)
      d. Byssinosis (cotton lint)
      e. Graphite (carbon)
      f. Siderosis (iron)
      g. *Silicosis* (silica), including chalicosis (Potter's disease), calcicosis (marble-cutter's disease) and diatom
      h. Silicatosis (asbestosis)
      i. Berylliosis
      j. Stannosis (tin)
   C. Lipiodol
   D. Thermal

4. DEPOSITION
   a. Xanthomatosis
   b. *Hemosiderosis* (mitral stenosis)

5. EMBOLIZATION
   a. Fat embolism
   b. Multiple infarcts, septic or aseptic
   c. Annular shadows due to occlusion of bronchial artery (Sante and Hufford)

6. TRAUMA
   a. Blast
   b. Pulmonary collapse complicating fractures of skull (Hodes and Groff)

7. VASCULAR LESIONS
   a. *Chronic passive congestion*
   b. *Pulmonary edema*
   c. Pulmonary congestive changes due to nephritis (nephritic butterfly)

8. BRONCHIAL LESIONS
   a. Atelectasis
   b. *Bronchiectasis*
   c. *Chronic bronchitis*
   d. Bronchial changes with cystic disease of pancreas

9. INFECTIOUS LESIONS
   A. Bacterial
      a. *Pyemia*
      b. *Bronchopneumonia*
      c. Brucellosis
      d. Tularemia
      e. *Tuberculosis*
      f. Syphilis (congenital)
      g. Fusospirochetosis
      h. Glanders
   B. Viral
      a. Atypical pneumonia
      b. Psittacosis
   C. Mycoses
      a. *Actinomycosis*
      b. Aspergillosis
      c. Blastomycosis
      d. *Coccidioidomycosis*
      e. *Histoplasmosis*
      f. Moniliasis
      g. Torulosis
      h. Toxoplasmosis
   D. Other types
      a. Tropical—paragonimiasis, schistosomiasis
      b. Pulmonary alveolar adenomatosis
      c. Amebiasis, ascariasis, echinococciasis

10. ALLERGIC CONDITIONS
   a. Topical eosinophilia
   b. Löffler's pneumonia
   c. *Periarteritis nodosa*
   d. *Disseminated lupus erythematosus*

11. FIBROTIC LESIONS
   a. Acute diffuse interstitial fibrosis (Hamman and Rich)
   b. Scleroderma
   c. *Irradiation fibrosis*
   d. *Bronchiolitis obliterans*
   e. Pulmonary changes in cases of drug addiction (Cole)

12. HEMOPOIETIC CONDITIONS
   a. Polycythemia vera
   b. Sickle cell anemia
   c. Leukemia

13. BOECK'S SARCOID

14. MALIGNANT LESIONS
   A. Lymphogenous and hematogenous metastatic lesions
      a. Sarcoma
      b. Carcinoma
   B. Lymphomatoid disorders
      a. Hodgkin's disease
      b. Lymphosarcoma

15. CALCIFIC LESIONS
   a. Hyperparathyroidism, vitamin D poisoning
   b. Mycoses: aspergillosis, histoplasmosis, etc.
   c. Mitral stenosis
   d. Miliary tuberculosis
   e. Metastatic osteogenic sarcoma with bone production
   f. Arteriosclerosis

*With the exception of certain additions, this table originally appeared in the article by Felson and Heublein.[1] Italics have been used to designate lesions that occur frequently or are of greatest interest.

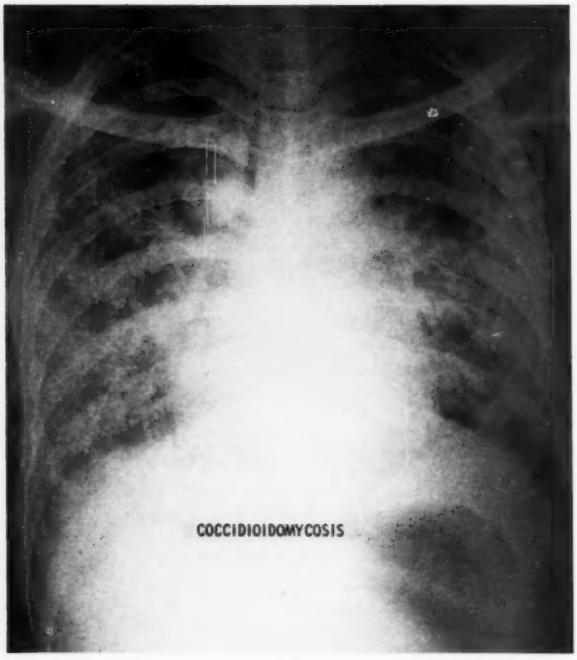
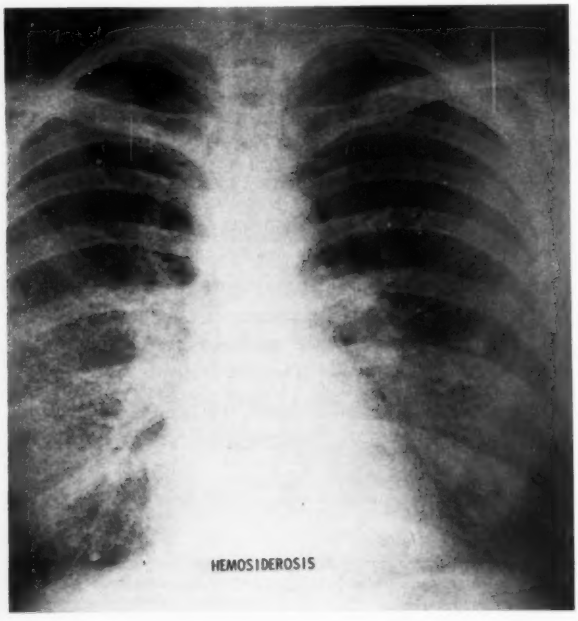


FIGURE 1. Disseminated coccidioidomycosis.

FIGURE 2. Hemosiderosis.



fluorescent tube. LIPIODOL® may have been retained if there is a history of bronchography. A history of tuberculosis is suggestive. If the patient is a worker who became ill in California or Arizona, the possibility of coccidioidomycosis must be considered (figure 1).

Physical Examination

Although physical examination often will not enable one to determine the underlying cause of diffuse pulmonary fibrosis, it may be helpful. In a case in which roentgenographic examination has disclosed diffuse pulmonary fibrosis, the detection of an epigastric mass by physical examination may lead to the diagnosis of carcinoma of the stomach and diffuse lymphangitic carcinomatosis of the lungs. Clubbing of the fingers is often associated with bronchogenic carcinoma. Mitral stenosis plus a history of repeated hemoptysis and pulmonary congestion points to hemosiderosis (figure 2). An asymptomatic patient with diffuse pulmonary infiltration and a hilar adenopathy suggests sarcoidosis.

Laboratory Tests

The diagnosis may be suggested by laboratory tests, which may become very involved and complicated. A blood count may point toward leukemia, and examination of the sputum may indicate the presence of tuberculosis, carcinoma or fungous disease. Determination of the value for the blood urea may suggest the presence of uremia, and an increase in the value for the protein-bound iodine may indicate the retention of Lipiodol. A negative tuberculin skin test and an increase in the value for the serum globulin point toward sarcoidosis (figure 3). Bronchography may confirm a suspicion of the presence of bronchiectasis. The results of a skin test and a complement fixation reaction may point to mycosis.

Every effort should be made to secure bronchial material by means of bronchoscopy, and biopsy should be performed on the scalenus fat pads, lymph nodes, sternal marrow and lungs. In addition, specimens should be cultured for pyogens, tubercle bacilli and fungi as indicated. These procedures may prove

helpful and even may be diagnostic in cases of such diseases as carcinoma, sarcoidosis, tuberculosis, fungous disease, lipid pneumonia, xanthomatosis, hemosiderosis and periarteritis nodosa.

Roentgenographic Examination of the Chest

The literature abounds with helpful suggestions for the roentgenographic diagnosis of the lesions that may cause diffuse pulmonary fibrosis. Unfortunately, exceptions are frequent. One author[2] said that the lesions of miliary carcinomatosis are much sharper and more discrete and dense than the lesions of miliary tuberculosis, but another author[3] said that the lesions of miliary tuberculosis usually are more discrete and have a more homogeneous density than the lesions of carcinomatosis. Felson and Heublein[1] said, "In the case of miliary disease . . . one must conclude that there is no constant or absolutely diagnostic appearance."

An egg-shell calcification and bilateral angel wings may suggest silicosis; a unilateral hilar mass suggests bronchogenic carcinoma and lymphangitic metastasis; enlargement of the paratracheal lymph nodes suggests Hodgkin's disease; the dense, metallic fine linear densities may suggest the presence of Lipiodol, and the presence of many fine, punctate, calcific densities may indicate healed or inactive histoplasmosis.

The rapidity of change on serial roentgenograms also is important. Rapid progression may suggest metastatic malignant lesions or severe progressive infection, whereas little or no change over a period of years may point to nonmalignant, stable lesions. Diffuse pulmonary fibrosis that is due to a nonmalignant lesion may cause difficulty by reducing cardiopulmonary function.

It usually is hazardous to express an opinion regarding the cause of diffuse pulmonary fibrosis solely on the basis of a single roentgenographic examination. In discussing the cause of so-called miliary shadows in roentgenograms of the chest, Austrian and Brown[4] said, "Generically, they could occur whenever irritants—bacterial, viral, mycotic, chemical or neoplastic—find bronchial or pulmonary lodgement, whether by bronchial, vascular or lymphatic routes, or whenever disseminated pulmonary-vascular lesions, localized allergy or stasis in the lesser circulation occur." This is essentially true. In any case in which roentgenographic examination reveals diffuse pulmonary fibrosis, a detailed history should be obtained, a careful physical examination should be made, and intensive laboratory procedures, including pathologic and bacteriologic examination, often are necessary. In some cases, the cause of the fibrosis will remain obscure after a complete autopsy has been performed.

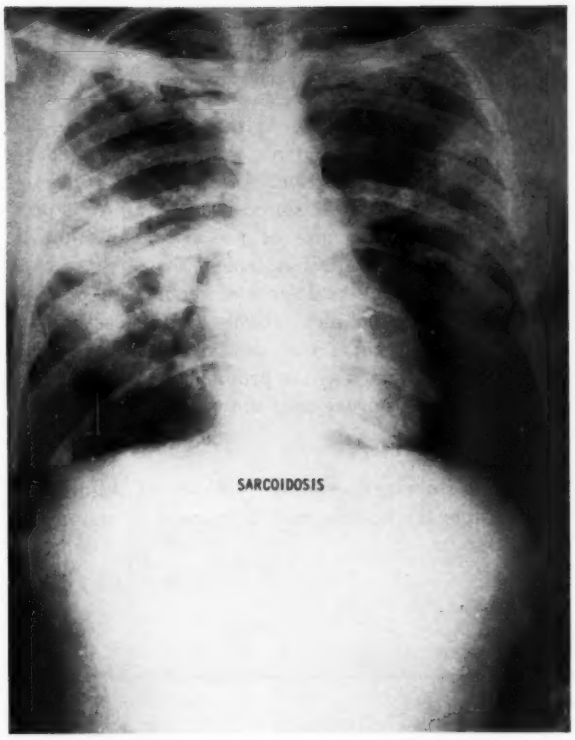


FIGURE 3. Sarcoidosis.

Prognosis and Treatment

The prognosis and treatment depend on the underlying cause of the fibrosis and on the complications. Isoniazid, streptomycin and

para-aminosalicylic acid should be administered in cases in which miliary tuberculosis is present. Bronchodilators usually are necessary in cases in which the fibrosis is associated with emphysema. Antibiotics should be administered if the fibrosis is complicated by bronchial infection. Digitalis and diuretics should be administered if heart-failure is present. If the cause of the fibrosis cannot be diagnosed definitely, and if the possible presence of tuberculosis has been ruled out, administration of relatively large doses of the corticosteroids may be tried. Unfortunately, these drugs may not produce any improvement or the improvement may be only temporary.

Summary

Roentgenographic evidence of diffuse pulmonary fibrosis may be caused by more than 75 different pathologic conditions. In cases of this disease, a detailed history should be obtained, a thorough physical examination should be performed, and extensive laboratory tests may be necessary to establish the cause. A review of serial roentgenograms of the chest frequently is helpful. Specific histologic, bacteriologic and serologic tests often are diagnostic. In some cases, however, the cause of the fibrosis will remain obscure even after complete autopsy.

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1959

INTERSTATE POSTGRADUATE MEDICAL ASSEMBLY

Nov. 2-5 Palmer House Chicago, Illinois

Remarks on Psychologic Impotence

Impotence is usually due to psychologic reasons, ranging from fear caused by inexperience to profound disturbances such as homosexuality. The common psychologic background, however, is related to a basic difficulty in combining attitudes of love and affection with the physical aspects of the love relationship. Impotence occurs when the person loved is thought to be forbidden as a sexual object. Treatment for this type of impotence involves the attempt to change such attitudes by means of psychotherapy. There is no known pharmacologic or surgical treatment.

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Pelvic lesions which require surgical treatment are primarily inflammatory, neoplastic or mechanical, or a combination of any of these types. Surgery is recommended for conditions such as certain benign ovarian tumors, hydrosalpinx, ectopic pregnancy, large uterine fibroids, etc. Surgery is not advisable in such conditions as corpus luteum cysts and acute salpingitis or postabortal inflammatory disease.

Clinical Indications for Pelvic Surgery

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IN the past few years, a panel discussion, "Clinical indications for pelvic surgery," has been a popular feature of the postgraduate course in obstetrics and gynecology given by the University of Buffalo School of Medicine. This panel is made up of three gynecologists and a general surgeon. We are summarizing here the opinions of this group concerning pelvic surgery. In this paper, the term pelvic surgery will be used to designate the surgical treatment of organs which are situated within the female pelvis and which are fundamentally intraperitoneal.

Pelvic lesions which require surgical treatment primarily are inflammatory, neoplastic or mechanical, or they are a combination of any of these types. Purely mechanical lesions of the pelvis are rather uncommon, but may include myoma, intestinal obstruction, or torsion of a pedunculate cyst.

Of the inflammatory lesions found within the pelvis, two extragenital lesions, namely, acute appendicitis and diverticulitis, must always be considered in differential diagnosis. The most common of these extragenital lesions, of course, is acute appendicitis. This disease may affect persons of any age, and the symptoms may mimic those of almost any intra-abdominal disease. Even today, appendicitis may first be seen in the stage of a pelvic abscess. The operative treatment of acute appendicitis needs no further discussion.

JOHN BURKE

EDWARD G. WINKLER

Diverticulitis most commonly occurs in persons who are more than 50 years of age, that is, at a period of life when inflammatory disease of the pelvis is quite uncommon. If acute diverticulitis associated with perforation should be confused with pelvic inflammatory disease and if it should first be discovered at the time of operation, we believe that the

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treatment should consist of drainage and proximal colostomy.

Intestinal obstruction resulting from adhesions to structures within the pelvis and particularly to the site of a previous operation is quite common. The clinical picture usually is sufficiently obvious to prevent the obstruction from being confused with any of the pelvic inflammatory lesions. However, it is not uncommon to find evidence of chronic, low-grade obstruction of the intestine when a pelvic operation is performed for other reasons. As a rule, simple lysis of the adhesions is all that is necessary, and primary intestinal resection rarely will be required.

Surgically, the ovary is a much abused organ. Some surgeons believe that the presence of an ovarian cyst, regardless of its size, is justification for an oophorectomy. Many ovarian cysts are corpus luteum cysts, which, as a rule, regress spontaneously. We believe that an ovarian cyst should be removed if it is more than 5 to 6 cm. in diameter, if it does not undergo regression, or if it enlarges consistently. Ovarian cysts may be removed during pregnancy. If possible, the operation should be postponed until the second trimester. If the cyst is a corpus luteum cyst, it will undergo regression by this time, and its removal will be unnecessary. A cyst which might complicate delivery certainly should be removed, as should any ovarian cyst which is believed to be malignant. We believe that dermoid cysts should be removed. About 25 per cent of these cysts are bilateral. If the patient is a young woman, an effort should be made to save some functional ovarian tissue if this is at all possible.

Other benign tumors of the ovary should be removed. Since granulosa cell tumors have a tendency to become malignant, bilateral oophorectomy frequently is recommended. If the patient is quite young and if a tumor is not present in the contralateral ovary, this ovary frequently is left to permit the possibility of pregnancy. It is not uncommon, however, for this seemingly normal ovary to show evidence of a tumor within a few years. The rare masculinizing tumors also should be removed. Wedge resection of the ovary is usually reserved for polycystic ovaries and for the Stein-Lowenthal syndrome.

Salpingectomy should be performed for hydrosalpinx, ectopic pregnancy and carcinoma, but it is not indicated for acute salpingitis or acute postabortal inflammatory disease. Salpingo-oophorectomy should be done for chronic pelvic inflammatory disease if there is a tubo-ovarian abscess present and if the ovary obviously is involved. Oophorectomy should be combined with salpingectomy if removal of the tube renders the blood supply to the remaining ovary precarious.

A fibroid of the uterus should be treated surgically if the tumor is large, if there is intractable bleeding, if there is evidence of degeneration of the tumor, or if it is believed that the tumor might have become malignant. Myomectomy occasionally is performed in cases of uterine fibroid if this is feasible and if the possibility of future pregnancy must be considered.

Operation also should be performed for adenomyosis and occasionally for intractable uterine bleeding. Hysterectomy obviously is indicated for carcinoma of the body of the uterus. In cases of this disease, the uterus, tubes and ovaries should be removed *en bloc*. Radical hysterectomy should be performed following irradiation in cases of carcinoma stage 0, 1, 2 or 3 of the cervix. In cases of carcinoma stage 2 or 3 of the cervix, radical dissection of the lymph nodes in a wide cuff of the vagina should be included.

Of the purely mechanical lesions involving the uterus, retroversion was at one time a popular reason for operation, and a wide variety of suspension operations were performed without very much success. At present, we believe that a uterine suspension operation should be performed only if a change in position of the uterus produced by a pessary proves effective or if the presence of prolapsed tubes and ovaries in the cul-de-sac of Douglas causes pain during intercourse. We believe that a suspension operation is definitely contraindicated for the relief of low back pain and other bizarre pelvic symptoms unless these symptoms have been relieved by the use of a pessary.

Opinions vary as to whether a repeat cesarean section or vaginal delivery should be done in cases in which a cesarean section has been previously performed. In a series of 761 repeat cesarean sections, in which there was no maternal mortality, the authors found that this procedure produced good results, relieved unnecessary anxiety, permitted the surgeon to inspect the scar in the lower uterine segment, and to repair any defect.

Repeat Cesarean Section

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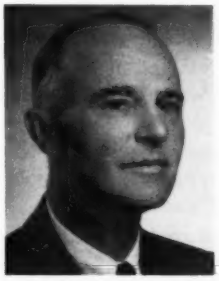
A GRADUAL increase in the number of repeat cesarean sections performed on nearly every obstetric service in this country is causing grave concern to some obstetricians. Opinions regarding delivery in cases in which a cesarean section has been performed previously have varied from "once a caesarean, always a caesarean"† to the recorded conviction of Douglas and Stromme[1] that delivery can be made safely by the vaginal route in 50 per cent of cases in which a cesarean section has been performed previously.

Over the years, there have been a number of reports showing the comparative value of repeat cesarean section and vaginal delivery in cases in which a cesarean section has been performed previously. According to published statistics, from 30 to 44 per cent of all cesarean sections are repeat cesarean sections.

Among the ardent advocates of vaginal delivery after a previous cesarean section are Cosgrove[2] and Douglas and Stromme,[1] who believe that a woman who has undergone a cesarean section should be permitted to demonstrate her ability to deliver her next baby by the vaginal route if the indications which necessitated the previous cesarean section no longer exist.



JAMES P. MARR

JAMES H. KO

Cosgrove[2] reported that 321 (64.2 per cent) of 500 women who initially were delivered by cesarean section at the Margaret Hague Maternity Hospital of Jersey City subsequently were delivered in the same manner and that 179 (35.8 per cent) of the women were delivered

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†The much-battered expression "once a caesarean, always a caesarean" apparently was first made by Dr. E. B. Cragin in a paper which was presented at a meeting of the Eastern Medical Society of the City of New York on Friday evening, May 12, 1916, and which was published in the *New York Medical Journal* 104:1 (July 1) 1916.

by the vaginal route. There were six maternal deaths in the cases in which a repeat cesarean section was performed, but no maternal death occurred in the cases in which the patients later were delivered by the vaginal route.

Birnbaum[3] reported that 77 (36.6 per cent) of 210 women who previously were delivered by cesarean section subsequently were delivered by the vaginal route at the New York Lying-In Hospital. The one maternal death in this group of 210 cases occurred in a case in which a repeat cesarean section was performed, and the death was attributed to air embolism. A defective uterine scar was observed in four of the cases in which a repeat cesarean section was performed, and a similar scar was palpated in eight cases in which the patients subsequently were delivered vaginally. It would be interesting to have a follow-up report in these eight cases.

At the Woman's Division of St. Luke's Hospital, our long-standing policy has been as follows: (1) repetition of a cesarean regardless of the indication for the previous cesarean section; (2) the use of a transverse incision in the lower uterine segment, and (3) careful and exact suturing of the uterine incision. Although such suturing, followed by an afebrile convalescence, makes the operator optimistic regarding a future pregnancy, he may be unpleasantly surprised to encounter a subsequent uterine rupture. It is well known that even a history of one or more successful vaginal deliveries after a previous cesarean section does not preclude the possibility of a future rupture of the uterus.

In a period of five years, namely, from January 1, 1952 to December 31, 1956, inclusive, 13,766 obstetric deliveries were made at the Woman's Division of St. Luke's Hospital. Of these 13,766 deliveries, 1,704 (12.4 per cent) were made by cesarean section. Nine hundred and forty-three (55.3 per cent) of the 1,704 cesarean sections were primary cesarean sections, and 761 (44.7 per cent) were repeat cesarean sections and were performed in a group of 643 cases. In order to determine the results that may be expected by following the rule "once a caesarean, always a caesarean," we made a study of the 761 repeat cesarean sections performed during this period.

At the time these 761 repeat cesarean sections were performed in the respective cases, the ages of the patients ranged from 20 to 46 years. Most of the patients were between 27 and 34 years old, and the average age was 32 years. No maternal death occurred in the 643 cases in which these 761 repeat cesarean sections were performed.

Five hundred and eight of the 761 repeat cesarean sections were the second, 191 were the third, 51 were the fourth, four were the fifth, five were the sixth, one was the seventh, and one was the eighth cesarean section that had been performed in the respective cases.

Seven hundred and forty-five of the 761 repeat cesarean sections were of the low-flap type and were performed by means of a transverse incision in the lower uterine segment; 13 were of the extraperitoneal type and were performed with the same incision. A transverse incision in the lower uterine segment, therefore, was used in performing 758 of the 761 repeat cesarean sections. Three classic cesarean sections were performed in cases in which the operator encountered vesical or omental adhesions that made the use of the transverse incision hazardous or impossible.

Incidence of Uterine Rupture as Related to Type of Previous Incision

At the time the repeat cesarean sections were performed, we observed 759 scars resulting from transverse uterine incisions which had been used in performing previous cesarean sections. In four instances there was a complete separation of the scar, and in 12 cases the scar was either defective or it was incompletely ruptured for a distance of 6 to 8 cm. Complete or incomplete rupture, therefore, had occurred in 16 (2.1 per cent) of the 759 scars. With one exception, all of the ruptured scars were covered with a vesical flap.

This incidence of complete and incomplete ruptures of the scars was a rather startling disclosure in view of our faith in the Munro-Kerr incision,[4] which was adopted by our staff surgeons years ago. In closing this incision, interrupted sutures of chromic catgut are placed in the muscular layer. These sutures are rein-

formed by a continuous suture which is placed in the fibromuscular coat of the lower uterine segment. The uterovesical peritoneal fold then is united with a continuous suture of fine chromic catgut. Incidentally, our British colleagues have long believed that a transverse incision in the lower uterine segment approaches the ideal.

Of the two scars resulting from a classic cesarean section which had been performed previously, one had ruptured incompletely and the other one had ruptured completely. This complete rupture was the only one that was diagnosed preoperatively in the entire group. In the case in which this rupture was observed, the fetus died in utero.

Thirty-two of the 759 transverse uterine scars were called thin, very thin or extremely thin. For the purpose of this survey, all of these scars were classified as thin but intact. Twenty-nine of these 32 scars were repaired. In seven instances, the fallopian tubes were ligated at the time the scars were repaired. In three instances, a total hysterectomy was performed for reasons other than the defective uterine scar.

Of the five scars which had ruptured completely, one was repaired. In three cases, a subtotal hysterectomy was performed for other reasons, and a complete hysterectomy was performed in one case.

Of the 13 scars which had ruptured incompletely, 10 were repaired. In two instances, tubal ligation was performed when the scars were repaired. In one instance, this operation was performed at the time of the patient's third cesarean section; in the other instance, it was performed at the time of the fourth cesarean section. Subtotal hysterectomy was performed in one case, and total hysterectomy was performed in one case. The subtotal hysterectomy was performed for uterine myoma at the time of the second cesarean section, and the total hysterectomy was performed at the time of the fourth cesarean section.

We have been unable to find any notation that the repaired scars were observed to be defective when a subsequent cesarean section was performed. Instead, the notation indicated that the scars were well healed.

Indications for Primary Cesarean Section in Cases Involving Rupture of the Uterine Scar

The indication for the primary cesarean section was placenta praevia in four cases and preeclampsia in four other cases. Three of the 18 patients were elderly primiparas, and cephalodisproportion was the indication in seven cases.

For those obstetricians who advocate vaginal delivery when the indication for the primary cesarean section no longer exists, as in the 18 cases in which rupture of the uterine scar occurred, it can be pointed out that defective healing of the scar may be due to poor development of the lower uterine segment or to its vascularity at the time of the primary cesarean section. However, this is merely an observation that may bear further investigation and study.

Incidence of Uterine Rupture in Relation to Number of Previous Cesarean Sections

At the time of the 761 repeat cesarean sections, the scars resulting from previous cesarean sections were inspected. Five hundred and eight of the scars were inspected at the time of the second cesarean section, 191 at the time of the third cesarean section, and 51 at the time of the fourth cesarean section. Of the 508 scars that were inspected at the time of the second cesarean section, 10 showed evidence of rupture. Three were ruptured completely, and seven were ruptured incompletely. Three of the 191 scars that were inspected at the time of the third cesarean section were ruptured incompletely. Of the 51 scars that were inspected at the time of the fourth cesarean section, one was ruptured completely and four were ruptured incompletely.

No rupture was noted in any of the cases in which four or more cesarean sections had been performed. One may speculate as to whether, at the time of the primary cesarean section, the lower uterine segment was better formed owing to a test of labor than it could be expected to be in cases of placenta praevia or preeclampsia in which primary cesarean

TABLE 1

REGRETTABLE NEONATAL DEATHS

CASE	CHARACTER OF LABOR	DURATION OF ANESTHESIA* (Minutes)	GESTATION (Weeks)	WEIGHT		PERIOD OF SURVIVAL	CAUSE OF DEATH
				Grams	Pounds		
1	Labor of 9.5 hr.	22	37	2353	5.2	3.5 days	Pneumonia
2	Labor of 12 hr.	22	38	2410	5.3	2 days	Atelectasis and pneumonia
3	Severe pain	28	38	3033	6.7	10 hr.	Atelectasis and hyaline membrane
4	Suprapubic pain for 12 hr.	34	36	2070	4.6	8 hr.	Atelectasis and prematurity
5†	Suprapubic pain for 5 days; labor for 12 hr.	24	32	522	1.15	32 hr.	Atelectasis and prematurity
				964	2.2	16 hr.	Atelectasis and prematurity

*Nitrous oxide and ether.

†Twins died in this case.

section undoubtedly was performed before the onset of labor.

Fetal and Neonatal Mortality

Seven hundred and seventy-two babies, including 11 sets of twins, were delivered by the 761 repeat cesarean sections. Ninety (11.65 per cent) of the 772 babies were delivered prematurely, but only five of these 90 babies failed to survive. Six of the 772 babies were stillborn. One of the six fetal deaths was due to placenta praevia and rupture of the uterus, one was due to abruptio placentae, and four were due to erythroblastosis fetalis. Eight babies died in the neonatal period. Five of the neonatal deaths were due to prematurity and atelectasis, two were due to congenital heart disease associated with other defects not compatible with life, and one was due to atelectasis. The gross fetal and neonatal mortality was 1.81 per cent, and the corrected mortality was 0.77 per cent.* The gross fetal and neonatal mortality is almost identical with that reported from the New York Lying-In Hospital and the Chicago Lying-In Hospital, where weight is the standard of classification. This standard of classification also was employed in our study.

Although six of the neonatal deaths might be classified as preventable, a careful scrutiny suggests the presence of extenuating circumstances (table 1). Two of the infants who died in the neonatal period were twins. The death of both of these babies was due to an obvious error in diagnosis. The height of the uterine fundus indicated that the pregnancy had reached term, and the mother complained of pain for 60 hours while she was an inpatient in the hospital. She had a desultory labor that lasted for 12 hours. A plain roentgenogram of the abdomen would have revealed the presence of premature twins. Both of the babies died shortly after birth. One weighed 1.15 lb. and the other weighed 2.2 lb. The scar resulting from the previous cesarean section was found to be intact.

In three of the five instances in which one or both babies died in the neonatal period, nitrous oxide and ether was administered for an average of 26 minutes before delivery.

Weight of 772 Babies

The weight of the babies, including those that were stillborn, is shown in table 2. Two of the 772 babies weighed less than 1000 gm., and 88 babies weighed less than 2500 gm. The average weight of the 772 babies was 3,090.7 gm., and 22 babies weighed more than 4000 gm.

*The corrected fetal and neonatal mortality was computed by deducting the six fetal deaths (four due to erythroblastosis, one due to placenta praevia and rupture of the uterus, and one due to abruptio placentae) and the two neonatal deaths due to congenital heart disease and other defects.

TABLE 2

WEIGHT OF 772 BABIES*

PREMATURE BABIES			MATURE BABIES		
Weight, gm.	*Number*	*Per cent*	*Weight, gm.*	*Number*	*Per cent*
500 to 1000	2	0.26	2501 to 3000	195	25.26
1001 to 1500	6	0.77	3001 to 3500	335	43.39
1501 to 2000	15	1.95	3501 to 4000	130	16.83
2001 to 2500	67	8.68	4001 to 4500	18	2.33
			4501 to 5000	4	0.51

*Including babies who were stillborn.

Morbidity

Antibiotics were administered as a prophylactic measure in approximately half of the 761 instances in which a repeat cesarean section was performed. The morbidity rate was 6.4 per cent, and can be attributed to various causes, including a small hematoma in one instance, wound infection in three instances, postpartum pyelitis in three instances, a transfusion reaction in four instances, and pneumonia in four instances. Other causes of morbidity were not mentioned in the records.

Complications

The bladder was incised accidentally in three instances, and the ileum was incised similarly in one instance. In one case, a subsequent operation was necessary to control hemorrhage that resulted from a slipped ligature following tubal ligation.

Vaginal Delivery Following a Previous Cesarean Section

In four cases in which a cesarean section had been performed previously, the patients went into labor at their homes 10 days to two weeks before the expected date of confinement.* When they were admitted to the hospital, examination revealed that the cervix was almost fully dilated and that the vertex was situated in the pelvis. In all of these cases, labor was allowed to continue; delivery was made with low forceps as soon as possible.

*These four cases are not included in the 643 cases that form the basis of the present report.

Summary and Conclusions

This report is based on 761 repeat cesarean sections which were performed in 643 cases. In 85 (11.2 per cent) of the 761 instances in which a repeat cesarean section was performed, the patients went into spontaneous labor. In 759 instances, examination disclosed a scar resulting from a transverse uterine incision used in performing a previous cesarean section. Sixteen (2.1 per cent) of these scars had ruptured completely or incompletely. Examination also disclosed two scars resulting from a classic cesarean section, and both of these scars had ruptured completely or incompletely. One hundred and two (15.8 per cent) of the 643 patients were sterilized by tubal ligation, usually at the time of the third cesarean section.

There was no maternal mortality. The gross fetal and neonatal mortality was 1.81 per cent, and the corrected mortality was 0.77 per cent. At first glance, these statistics would seem to indicate that repeat cesarean section is a safe procedure for the mother but somewhat hazardous for the infant, either because of poor timing of an elective cesarean section or because the mother may go into premature labor spontaneously.

It is obvious from this study that the survival rate for premature infants might be improved. Atelectasis might be prevented by more efficient management. It is suggested

that earlier and closer cooperation of the anesthetist, the attending obstetrician and the resident might make it possible to save some of the premature infants who are born with respiratory difficulties.

It is held that repeat cesarean section relieves both the surgeon and the mother of unnecessary anxiety. It permits the surgeon to inspect the scar in the lower uterine segment. It also gives him an opportunity to repair any defective scar and thus reduces the necessity of performing a hysterectomy in many cases.

In any case in which a cesarean section has been performed previously, a repeat cesarean section performed at or near term produces a good result and calls for the least display of obstetric virtuosity.

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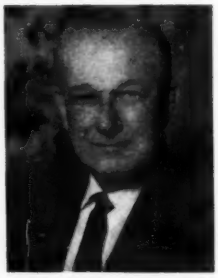
1959

INTERSTATE POSTGRADUATE MEDICAL ASSEMBLY

Nov. 2-5 Palmer House Chicago, Illinois

The Use of ACTH and Corticosteroids in Allergic Disease

ACTH and corticosteroids play a major role in the symptomatic treatment of asthma, urticaria, atopic dermatitis, vasomotor rhinitis, hay fever and drug reactions. The use of these medicaments in selected patients depends on the severity of the condition and the nature of the allergic syndrome; they may be used freely in syndromes of known etiology and short duration. When to use ACTH or corticosteroids or a combination of both and the relative merits of intravenous and intramuscular administration of ACTH will be discussed.



STANLEY F. HAMPTON, M.D.

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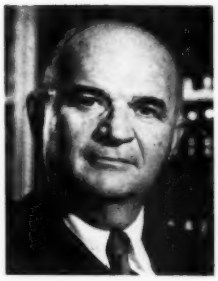
Problems in Abdominal Surgery

WALTMAN WALTERS*

Mayo Clinic and Mayo Foundation, Rochester, Minnesota

Abdominal exploration should be done in cases of severe abdominal pain or intestinal bleeding or both when there is no clinical evidence of intra-abdominal disease.
Laboratory procedures should supplement, not replace, evaluation of physiologic or pathologic changes in establishing clinical diagnosis.
Illustrative cases are discussed.



WALTMAN WALTERS

It has been my pleasure to appear before this assembly for a great many years, and each year I have tried to discuss things which I thought were new and interesting. At least they were from my standpoint. I thought I might first just mention briefly some of the things which I have learned in the past year.

I think one of the most important is to make more use of abdominal exploration for severe abdominal pain or intestinal bleeding or both when there is no clinical evidence of intra-abdominal disease. I now look on this procedure as an additional test rather than an additional operation and have so informed the patients. I am sorry to say that on many occasions I have found small carcinomas of the pancreas; on some occasions I have found small stones in the gallbladder even though the roentgenograms seemed to show normal filling and emptying. I have found retrobulbar ulcers in patients with histories of ulcer whose roentgenograms did not show the ulcer because of its location. I also found a bleeding metastatic melano-epithelioma of large size in the duodenum in one patient; it was the size of a half-dollar, but did not show up in the roentgenogram. The episodes of bleeding had been severe. The patient's left eye had been removed 12 years previously for a melano-epithelioma.

A few days ago I operated on a man with a history of biliary tract disease whose roentgenograms showed gallstones. Twenty-four years ago he had had a resection of his stom-

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Presented before the forty-third annual Assembly of the Interstate Postgraduate Medical Association at Cleveland.

ach for an adenocarcinoma, grade 3. His lesion at this time was a metastatic adenocarcinoma, grade 2, in the liver, with metastatically involved nodes in the hepaticoduodenal ligament, one of which was obstructing the common duct. The lesion was the same as the one removed 24 years ago from the stomach. The patient also had gallstones. I removed his gallbladder and the metastatic nodes obstructing the common duct.

In the last year I have operated on three patients with jaundice due to chlorpromazine hydrochloride (THORAZINE®). All of these patients had taken only a few tablets; in fact, one of the patients had taken only two. The jaundice appeared a month after they had taken the Thorazine. The symptoms were identical to those of an extrahepatic obstruction. The gallbladder and the common duct were slightly enlarged. Cholecystostomy and an exploratory choledochostomy were performed so that I could be sure that there were no stones in the common duct. The rapidity with which the jaundice decreased after T tube drainage of bile has made me believe that a dysfunction of the sphincter of Oddi which has produced some increase in intraductal pressure is associated with the changes in the liver in Thorazine jaundice.

You will recall that Dr. Altemeier* spoke about the work in France on viral hepatitis. Mallet-Guy of Lyons has been doing periarterial sympathectomy on the hepatic artery and has shown some definite results.

My colleagues and I at the Mayo Clinic have been amazed to find that the insertion of a T tube into a normal-sized common duct of patients with biliary cirrhosis and intense itching will relieve the itching; when the T tube is removed, as we have done in a few of these cases, the itching has returned. When we reinserted the T tube in the common duct, the common duct was enlarged. In the last such operation done about a week ago, I had some difficulty getting the dilator through the sphincter of Oddi. This leads me to believe that there may be inflammation at the lower end of the duct. We know that there is inflammation in the liver and possibly in the common duct, because in most of those cases a lymph node lateral to the biliary duct is enlarged.

I recently have had a chance to study a group of 429 patients on whom I had operated for stricture of the common and hepatic ducts at the Mayo Clinic since 1924. In one series there had been a lapse of from 5 to 25 years since the operations. The results in this series were compared with results in a contrasting group with a one to five year follow-up. Approximately 70 per cent of these patients, whether the anastomosis was duct to duct or duct to duodenum, have had excellent or good results. We intend to report this material in detail later.

Lastly, in this preliminary discussion, I continue to believe that patients with both recurring gastric and recurring duodenal ulcer complicated by obstruction, bleeding or intractable pain are best treated by gastric resection of the Billroth II or the Polya type. This procedure has given us the best results with a lower recurrence and the same risk as the Billroth I operation. After the Billroth I operation, with the same amount of stomach removed as in the Billroth II for recurring complicated duodenal ulcer, the incidence of recurrence of ulcer is twice as great and the functional results are not sufficiently better to make up for this increase in recurrences.

In duodenal ulcer, this applies to women as well as men; in other words, the Billroth I is not as good an operation as the Billroth II for women.

We will proceed with the presentation of three very interesting cases.

Through the kindness of Dr. Robert Cueva, who is one of the chief senior residents at the Cleveland Metropolitan General Hospital, we are able to present a brief history of three cases, and the patients who have kindly consented to be presented are here. A young girl is our first patient.

Will you give us the history, Dr. Cueva?

Ruptured Cyst of the Ovary

DR. ROBERT CUEVA: The patient, who is 12 years old, has been having menstrual periods

*Altemeier, W. A. and Vilter, R. W.: Medical and surgical problems in liver disease. Postgrad. Med. 26:167-178, 1959.

for more than one year, and on three occasions during the past year she has felt crampy pain in the right lower quadrant of the abdomen, accompanied by nausea and vomiting. Some pain of this sort also had been present two years previously.

During the last episode of pain, laparotomy was done, and a bleeding follicle was found in the left ovary. The ovarian follicle was excised locally and the appendix was removed as an incidental procedure. She, therefore, presents the problem of intermittent attacks of abdominal pain severe enough to raise the question of whether or not operation should be done, and Dr. Walters will discuss that.

DR. WALTERS: This young lady presents a condition that might be referred to as *mittelschmerz,* a term which, like *auf Wiedersehen,* is a little difficult to express succinctly in the English language. It refers to pain in the middle. It does not mean pain in the middle of the abdomen, but it means pain in the middle of the menstrual cycle. Let me state that again: It is pain which occurs between the menstrual periods.

There is reason to believe that at her two or three admissions to the hospital, this young lady had a ruptured ovarian cyst, and that the last cyst, when she was operated on, was bleeding and that blood in the pelvis was responsible for her pain.

Two or three very interesting features should be emphasized. With her three attacks, she had leukocytosis, rebound tenderness, and pain which was mostly in the right lower quadrant, although she also had some pain in the right flank.

On her second admission, a thorough examination was made again. An intravenous urogram showed nothing abnormal in the renal region, and urine was normal, so that a renal lesion could be excluded.

All of you must feel, as I do, that this case was very well handled. The hemorrhagic corpus luteum cyst was just shelled out of the left ovary, and the ovary was preserved. The significance of that important and conservative procedure is that she may have other attacks as the result of a ruptured corpus luteum cyst in the right ovary, and if the left ovary had been removed and a really destructive cyst should develop in the right ovary it would be serious.

The value of removing the appendix, I think, is quite apparent. If these attacks are going to occur, we physicians want to be sure that acute appendicitis cannot develop, for if it did, it could be mistakenly diagnosed as another ruptured corpus luteum cyst and treated conservatively. If I remember correctly, when I was doing some gynecologic surgery we not infrequently made the erroneous diagnosis of acute appendicitis in cases of bleeding from ruptured cysts of the ovary. This young lady, it will be noted, also had pain in the right flank, which in the absence of any other intra-abdominal lesion and with a normal urinary tract may have been due to the irritating effect of blood around her liver and under the right side of the diaphragm. It may have been sucked up there by the respiratory movement of the diaphragm as it is when there is leaking from a perforated duodenal ulcer.

The operation also gave the surgeons an opportunity to exclude the possibility of Meckel's diverticulum.

Functioning Carcinoid Tumor

The patient is a man, age 70 years. Dr. Cueva, will you make a few remarks about this patient?

DR. CUEVA: The patient came into the emergency room rather acutely ill with severe abdominal pain and just a little nausea and vomiting. The pain was intermittent and crampy on admission, and became somewhat less severe shortly after medication was given. Temperature and leukocyte count were normal. The differential count showed elevated polymorphonuclear leukocytes. The abdomen was not distended; it was tender all over, but especially in the right upper quadrant. Rebound tenderness was referred to the right lower quadrant. Digital examination disclosed tenderness of the rectum which was more severe on the right. He had no bowel sounds at all when we were examining him.

He has been known to have a lot of emphysema and rheumatoid arthritis. He has never had any steroids by mouth.

Roentgenograms of the abdomen showed slight dilatation of the distal part of the ileum which contained quite a bit of air and very little fluid. There were no fluid levels. Several loops of the small bowel were arranged in a ladder pattern. The cecum and parts of the ascending colon were dilated and contained air. The findings in the rest of the abdomen were not remarkable.

It is interesting that the patient had had some abdominal complaint a year and a half ago. We studied the gastrointestinal tract carefully, making roentgenograms after barium enemas, with negative results.

DR. WALTERS: Will you briefly relate what the finding was at operation referable to the terminal ileum, and the operative procedure?

DR. CUEVA: A diagnosis was made of acute abdomen and probably acute appendicitis with a question of obstruction of the bowel, and exploratory operation was carried out. We made a right-sided incision and were amazed to see a rather pink fluid in his abdomen, approximately 1 l. of it. We found the appendix on top of the ileum at the ileocecal valve adhering to the peritoneum of the pelvis; an extra loop of bowel had gone under the appendix too. There was an internal hernia of the distal portion of the ileum, with infarction of approximately the distal 2 ft. of ileum.

We mobilized the appendix and felt a mass, which was much firmer than the rest of the appendix; we were not smart enough to call it a carcinoid, which it turned out to be, a carcinoid in the tip of the appendix. We were forced to remove the distal portion of the ileum and cecum, performing an end to end ileoascending colostomy and decompressing ileostomy.

DR. WALTERS: Of importance in this case were the recognition from the signs and symptoms, which Dr. Cueva has mentioned, of the possibility of intestinal obstruction, the immediate surgical procedure which was carried out, and the finding of the carcinoid tumor. I should like to present briefly a little data referable to carcinoid tumors.

Originally carcinoid tumors were thought to be benign. As experience with them increased, it was learned that they were malignant, although they characteristically metastasized slowly.

About five years ago it was discovered that some large carcinoid tumors were endocrine tumors in the sense that they formed a blood-borne agent called serotonin that has profound effects throughout the body.

Probably 50 to 90 per cent of the carcinoids arise in the appendix, are of a low degree of invasiveness, and do not ordinarily spread beyond the regional lymph nodes. The present case is doubtlessly one of these. Carcinoid tumors, however, can arise in any part of the gastrointestinal tract from the stomach to the rectum, from the gallbladder, from the lungs, and even from a teratoma which contains gastrointestinal epithelium. Current interest in carcinoids centers around their ability to secrete serotonin and the syndrome which they produce. Only patients with large deposits of carcinoid tissue develop this syndrome. In fact, all patients with this syndrome, so far as I know, have had extensive hepatic metastasis with the exception of one or two whose carcinoid tissue developed in ovarian teratomas.

Now what is serotonin? The amino acid, tryptophan, in the diet is changed to 5-hydroxytryptophan which in turn is changed to serotonin. Serotonin has epinephrinelike effects on smooth muscle and also may be associated with increased production and excretion of histamine. A degradation product of serotonin called 5-hydroxyindole acetic acid (5-HIAA) is excreted in the urine, and the diagnosis is made by recognizing excessive excretion of the substance. Normal urine contains from 2 to 9 mg. of it daily. There is a qualitative test not sufficiently sensitive to detect normal quantities of it (2 to 9 mg.) in urine but sensitive enough to detect increased quantities. If the qualitative test gives a positive result, a quantitative test can be done to make the diagnosis more secure.

The carcinoid syndrome consists of some or all of several clinical manifestations: Flushing of the skin is usually intermittent but occasionally continuous. It may last for from 30 seconds to several days but usually lasts a few minutes. Associated with it is a feeling of great warmth. Diarrhea may be mild or severe

and the stools ordinarily are not bloody. Asthma, noted in 3 of 12 cases encountered at the Mayo Clinic, is ordinarily mild. Valvular heart disease which is not rheumatic in origin has been described in some patients. Hepatomegaly is common and is usually due to metastasis. A positive result of the test for 5-hydroxyindole acetic acid in the urine is the rule, and serotonin can be extracted from tumor tissue. In some instances, enough tumor tissue can be removed surgically to give at least temporary improvement, but often the presence of a tumor in the root of the mesentery of the small intestine and in the liver makes surgical treatment of no avail. The urinary excretion of 5-hydroxyindole acetic acid returned to normal in one case encountered at the Mayo Clinic when carcinoid tissue in an ovarian teratoma was removed. It appears that the urinary test for hydroxyindole will be useful to detect metastasis of functioning tumors of this type.

Pancreatitis

Now, Dr. Cueva, would you give us the history of the last patient?

DR. CUEVA: The patient is a 32 year old man who came to the emergency room complaining of severe abdominal pain. He admitted to rather heavy ingestion of alcohol during the past year, and especially during the month prior to admission to the hospital, which was approximately one month ago. He had lost 20 lb. and was eating very little. His stools for the last week had been liquid. Sharp epigastric pain which extended to the left upper quadrant of the abdomen developed approximately 36 hours before admission. The pain became diffuse but remained worse in the upper quadrants. He vomited green-yellowish material twice on the morning of admission.

He denied hematemesis, melena, intolerance to food, jaundice and malaria. He did not work with paints or lead. Significant findings were localized to the abdomen, which was slightly distended and markedly tender to palpation; it was most tender in the upper quadrant where there was rebound tenderness. Bowel sounds were almost absent. The abdominal wall was hard to depress, the abdomen was slightly distended, and there was some diffuse voluntary guarding.

Examination showed a moderately tender rectum, and a normal prostate. A guaiac test of the stools gave a negative result. The hematocrit reading on admission was 50 per cent; the leukocyte count was 14,000 per cubic millimeter of which 80 per cent were polymorphonuclear leukocytes, 5 per cent were band cells, and 15 per cent lymphocytes.

The specific gravity of the urine was 1.030; urinalysis revealed a trace of acetone and no albumin, sugar or bile. There were one or two white blood cells per high-power field.

We suspected when we first saw this patient—mainly because he looked more chronically than acutely ill and because his history showed intestinal congestion—that he was having a recurrent attack of pancreatitis. We tested for serum amylase and the value was 290 per cent. The values for all the other chemical constituents of the blood were within normal limits. X-rays of the chest and abdomen on admission were not remarkable.

We studied this patient thoroughly, including x-ray studies of the gastrointestinal tract, with negative results, and so far we have not been able to make a diagnosis. We thought of the possibility of tuberculous peritonitis with tuberculous pleuritis. The result of a tuberculin test was strongly positive, but left-sided thoracentesis was not successful.

We recently treated him for pancreatitis and he improved. He is asymptomatic at present and we hope he will continue to abstain from alcohol and will continue to do well.

DR. WALTERS: I should like to ask one or two questions. You will remember that in the panel discussion* on pancreatitis, the question came up about the functioning of the gallbladder in relation to pancreatitis. This man, interestingly enough, had a nonfunctioning gallbladder on his first admission into the hospital, so the question of differential diagnosis arose. Are his attacks of pain from acute cholecystitis, or from acute pancreatitis?

Now, I don't recognize this particular percentage of serum amylase, 290 per cent. That

*In press.

is a little different from the way we grade it. Is this elevated?

DR. CUEVA: Yes, any figures above 100 per cent are elevated.

DR. WALTERS: Dr. Cueva tells me also that a recent cholecystogram revealed that the gallbladder is now normally functioning. Is that correct?

DR. CUEVA: Yes.

DR. WALTERS: So the probabilities are that the original diagnosis of pancreatitis is correct.

Was a peritoneal tap done in this case?

DR. CUEVA: Yes, but we were unable to obtain any fluid. A minimal shift in dullness developed during his hospitalization, and we were hoping to obtain some fluid, but we were unsuccessful. We attempted it twice and were unsuccessful.

DR. WALTERS: You also heard Dr. Cueva say that an x-ray of the abdomen and chest did not reveal any fluid in the left pleural cavity. In the panel it was said that infection may extend through the lymph vessels of the diaphragm and that sometimes there is a little fluid in the left pleural cavity. Such did not exist here. It seems to me that the diagnosis of pancreatitis probably is correct. The patient apparently has been doing quite well since abstaining from alcohol and following the program outlined for him. Is that right?

PATIENT: Yes.

DR. WALTERS: Thank you very much for coming.

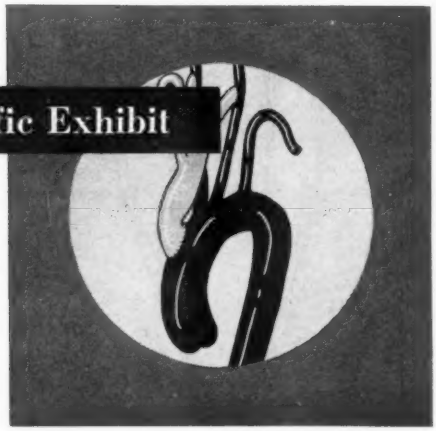
Comment

I have just one remark to make in the minute that remains. Peritoneal tap is a good procedure, but one must not rely on it as being 100 per cent accurate, any more than one can rely on a negative x-ray examination in the presence of a history suggestive of an intra-abdominal lesion. For example, I recently have seen a patient who had a ruptured spleen, the bleeding occurring into the tissue within the capsule of the spleen. A peritoneal tap was made but no fluid was obtained. Unfortunately a roentgenogram of the abdomen had not been made. In cases of that sort, with blood in and around the spleen, you frequently have displacement of the stomach.

The point I wanted to make as I opened my presentation and as I close it is, as was so well brought out in that excellent panel discussion on pancreatitis that Dr. Zollinger moderated, that if we use the knowledge gained from the practice of medicine and know the effects of pathologic changes and what you can expect from laboratory procedures, you will usually win out in making the correct diagnosis. Do not rely for the major part of your diagnosis on laboratory procedures, especially if they do not support your clinical diagnosis—but use them for the purpose for which they are intended, namely, as aids in the evaluation of physiologic changes or the pathologic ones that have occurred.

Surgical Considerations in the Treatment of Cerebral Arterial Insufficiency

Scientific Exhibit



E. STANLEY CRAWFORD
MICHAEL E. DEBAKEY
WILLIAM S. FIELDS
GEORGE C. MORRIS, JR.
DENTON A. COOLEY

Cora and Webb Mading Department of Surgery and
Department of Neurology, Baylor University
College of Medicine, Houston, Texas

Location of Lesion

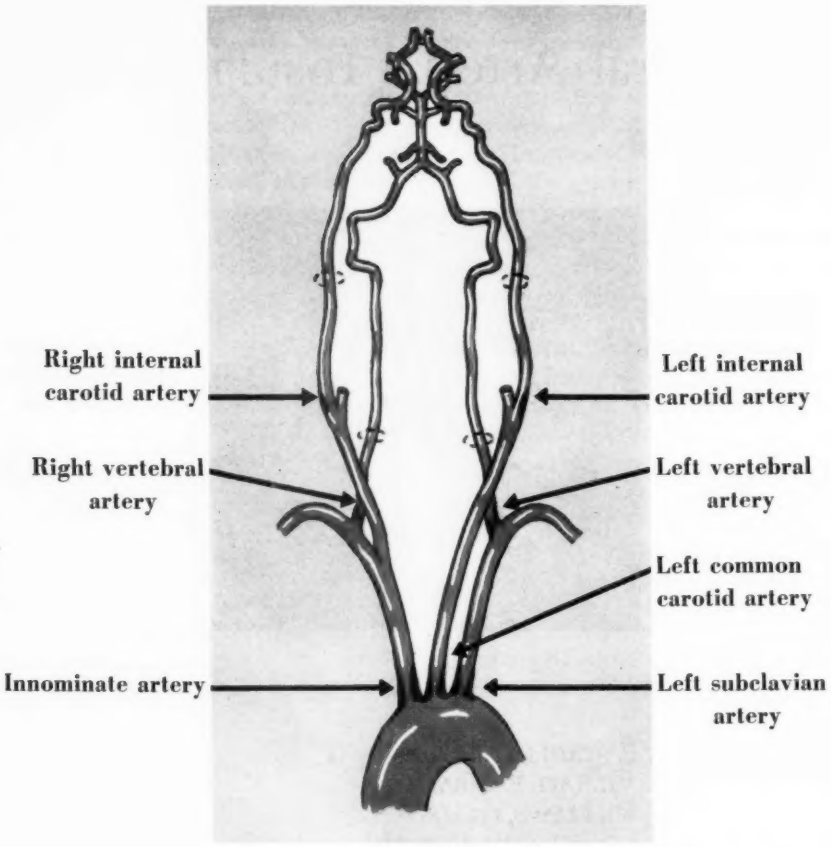


FIGURE 1. Characteristic locations of extracranial lesions causing cerebral arterial insufficiency.

THE lesion causing cerebral arterial insufficiency is located outside the skull in approximately 25 per cent of cases. Because of this fortunate location and the size of the involved artery, these lesions may be treated by employing the newer vascular technics.

Clinical Picture

Symptoms

1. Hemiparesis
2. Blurred vision
3. Focal paresthesia
4. Diplopia
5. Vertigo
6. Dysphasia

The cases most suitable for operation are those with transient attacks.

Signs

Frequently normal on examination.

Varying degrees of neurologic deficit.

Occasional diminished or absent pulses in neck and arms.

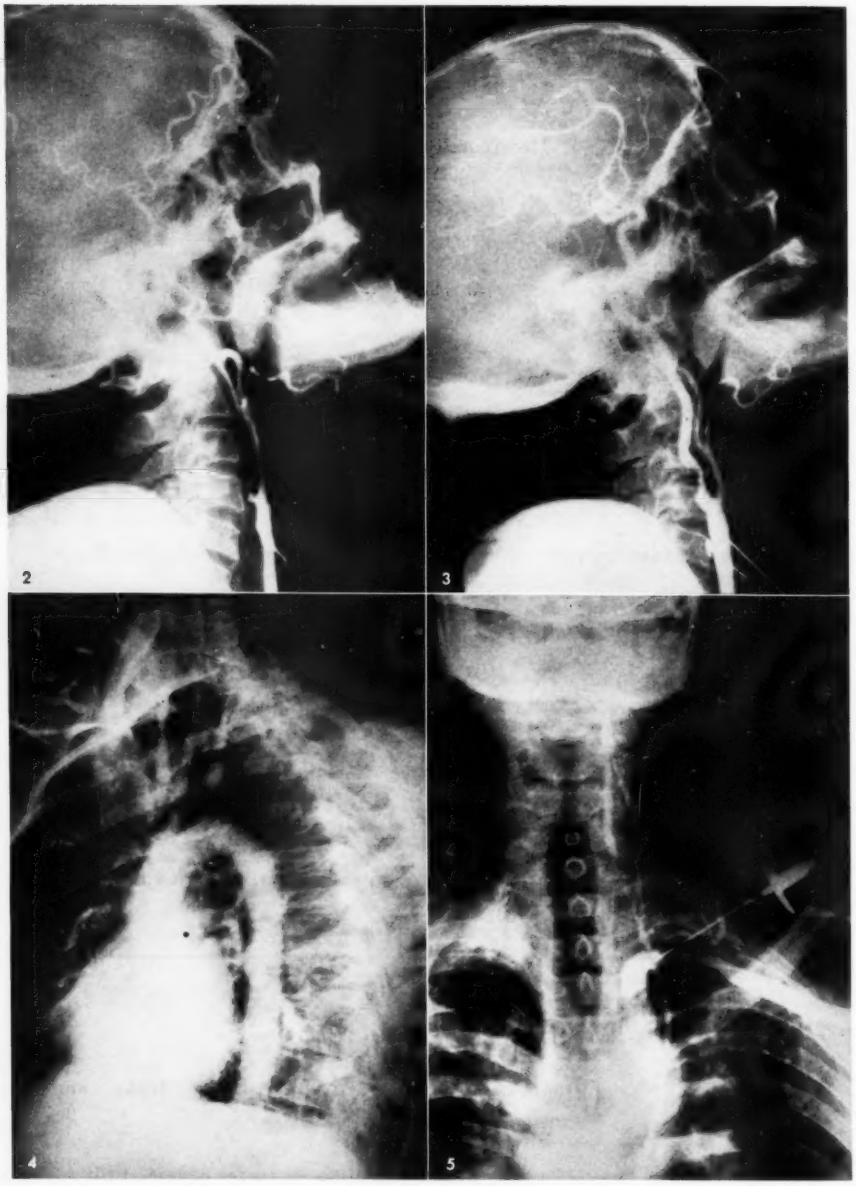
Occasional systolic murmurs over obstruction.

Diagnosis

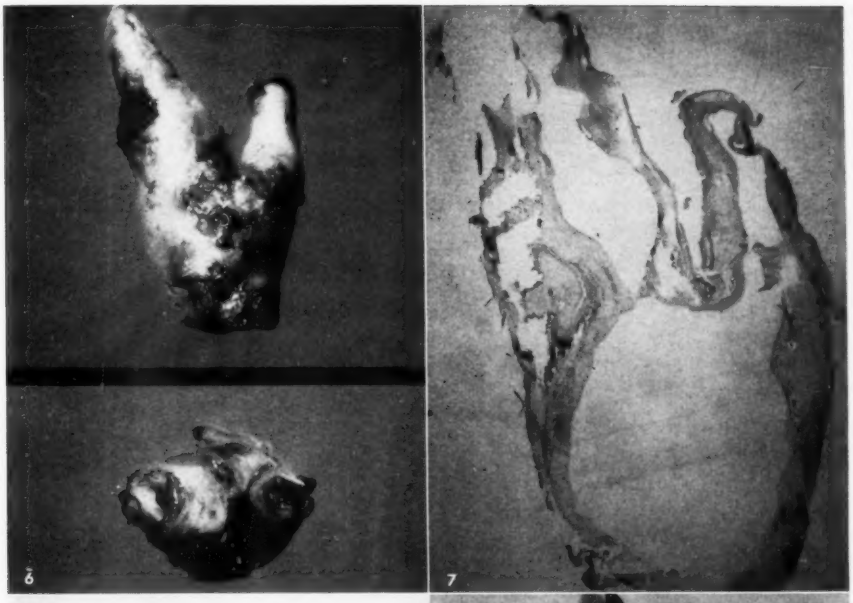
Diagnosis is suspected in all cases of "stroke" and those with transient ischemic attacks.

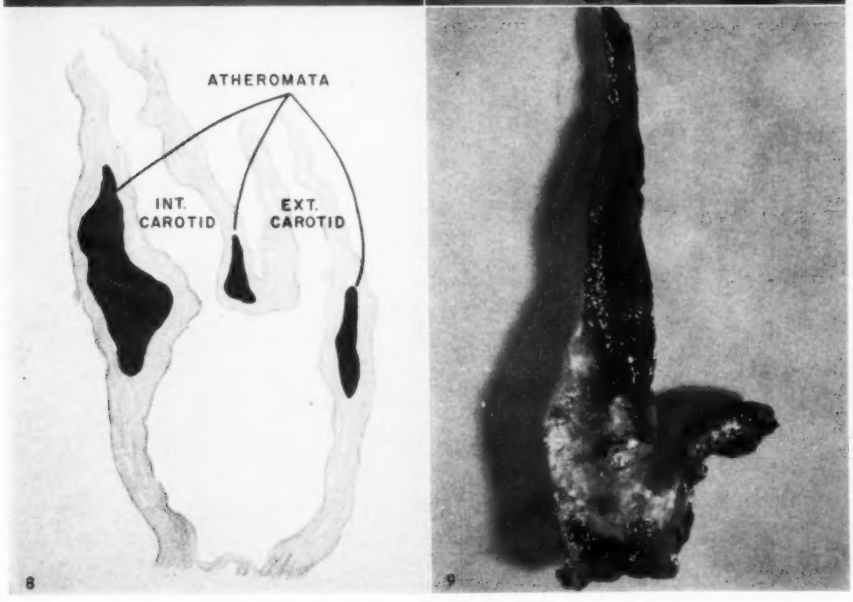
Accurate localization of the lesion is obtained by angiography.

Angiographic Patterns of Occlusions in the Extracranial Cerebral Circulation



2. Complete occlusion, internal carotid artery (rarely a candidate for operation).
3. Incomplete occlusion, internal carotid artery (ideal candidate for operation).
4. Complete occlusion, innominate, and partial occlusion, left common carotid and subclavian arteries at the aortic arch (ideal candidate for operation).
5. Complete occlusion, left vertebral artery (ideal candidate for operation).

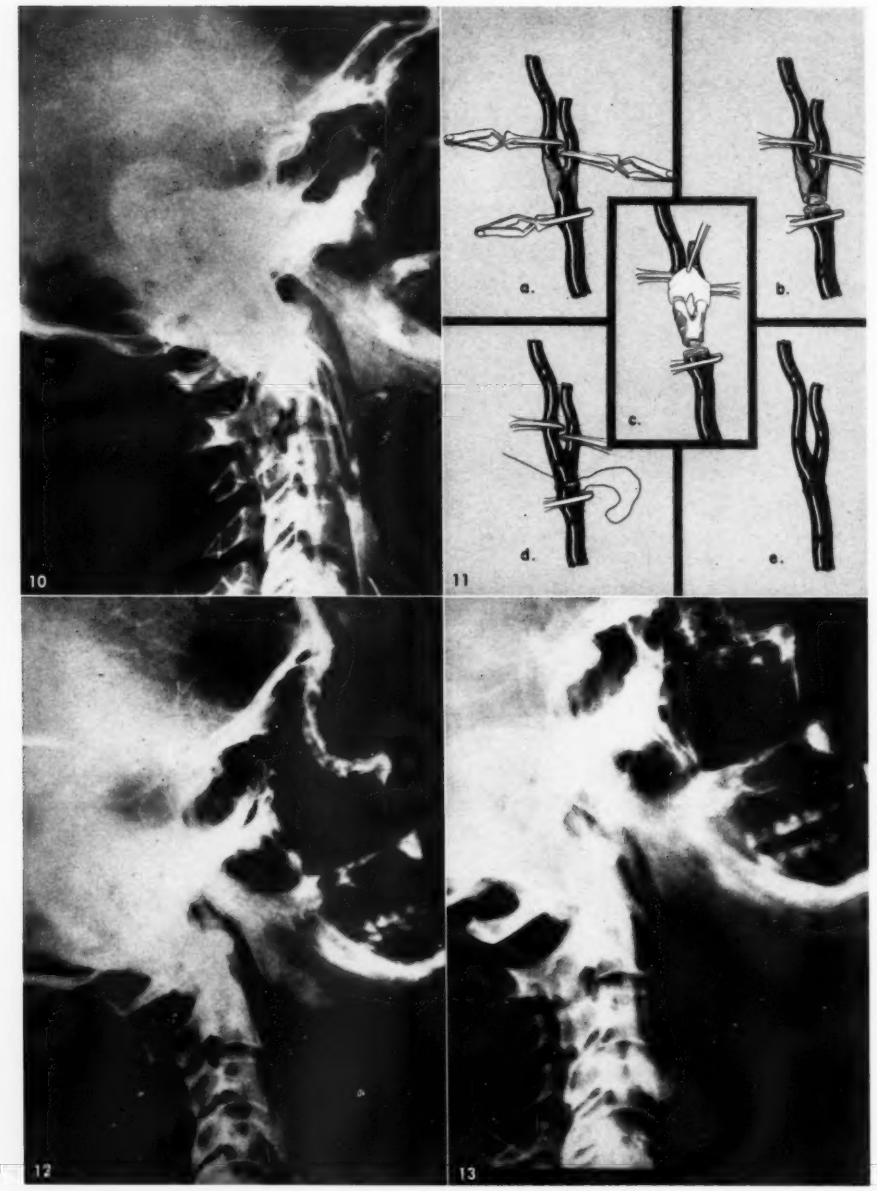




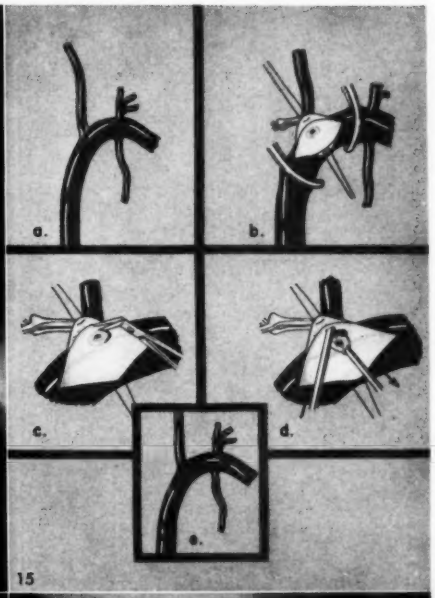
6. Specimen removed by endarterectomy showing partially occluded lumen.
7. Photomicrograph showing localized atheromas partially occluding internal carotid artery.
8. Diagram of photomicrograph showing atheromas.
9. Gross specimen showing thrombus superimposed on atheromatous lesion causing complete occlusion.

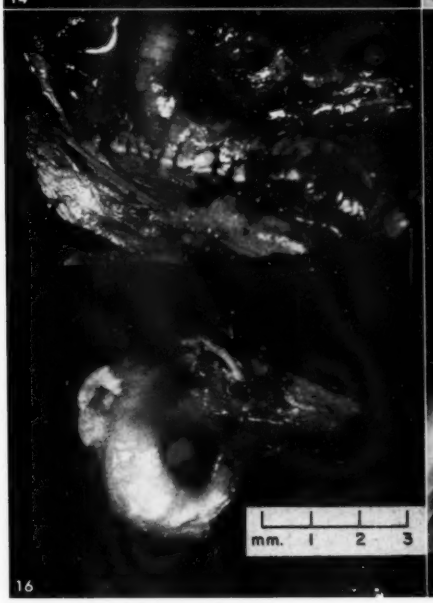
Treatment

Endarterectomy
Internal Carotid Artery



10. Partial occlusion, internal carotid artery.
11. Technic of operation.
12. Arteriogram 12 days after operation.
13. Arteriogram five months after operation.

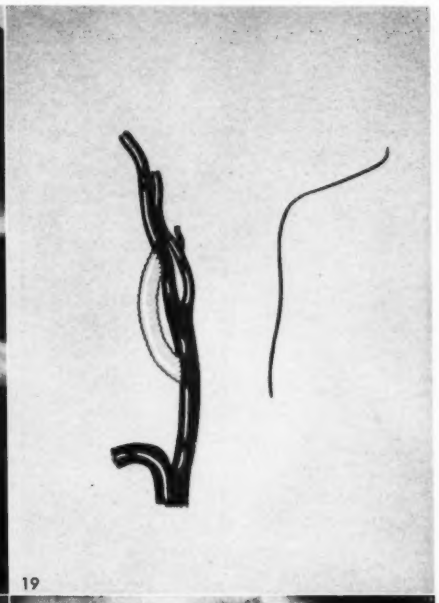




14. Complete occlusion, right vertebral artery, and partial occlusion, left vertebral artery.
15. Technic of trans-subclavian vertebral endarterectomy.
16. Photograph at operation and gross specimen removed by endarterectomy.
17. Left vertebral arteriogram after operation.

Bypass Graft
Carotid Artery

18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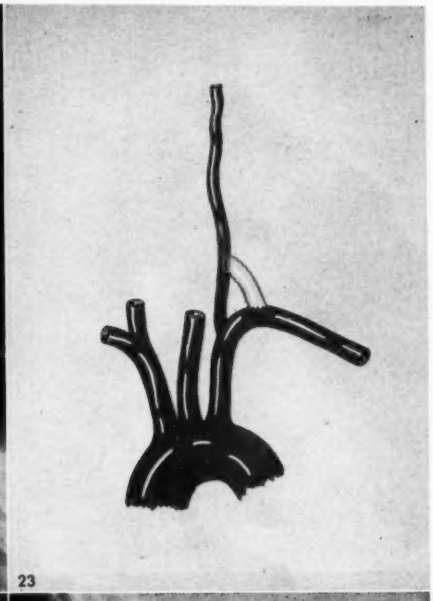
18. Partial occlusion, internal carotid artery.
19. Diagram of operation.
20. Graft bypassing occlusion of internal carotid artery.
21. Arteriogram after operation showing functioning graft.

Vertebral Artery

22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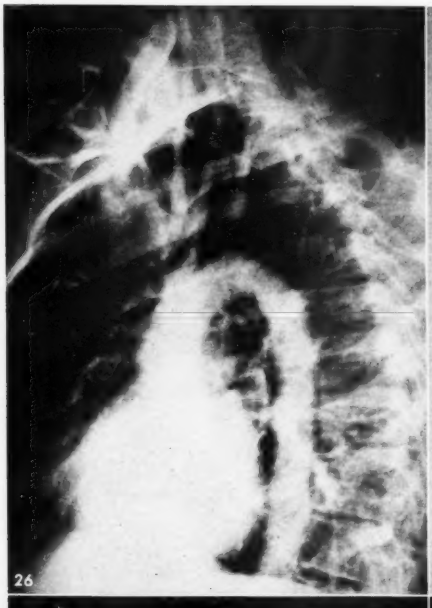
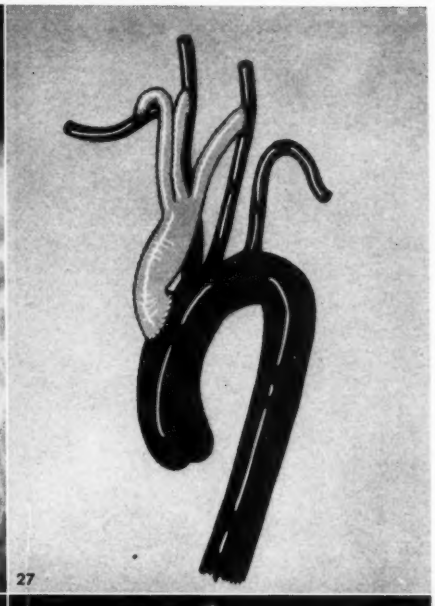
22. Complete occlusion, left vertebral artery.
23. Diagram of operation.
24. Graft extending from subclavian artery to vertebral artery.
25. Arteriogram after operation showing functioning graft.





26. Aortogram showing complete occlusion of innominate and partial occlusion of left common carotid and left subclavian arteries.
27. Diagram of operation.
28. Graft in place.
29. Aortogram after operation showing functioning graft.

Results

LOCATION	NUMBER OF CASES	NUMBER OPERABLE		SUCCESSFUL RESULTS IN OPERABLE CASES	
		Number	Per Cent	Number	Per Cent
Internal carotid	34	22	65	18	82
Partial	18	18	100	16	90
Complete	16	4	25	2	50
Common carotid	8	8	100	8	100
Innominate	7	7	100	7	100
Subclavian	13	13	100	12	92
Vertebral	5	4	80	3	75
TOTAL	67	54	81	48	89

The author suggests that the physician treat benign tumors of the skin by the method most familiar to him, being always mindful of the cosmetic result. For precancerous dermatoses, electrosurgery, electrocautery, electrodesiccation or surgical excision is recommended, according to the type of lesion. The same procedures are advised for various types of benign epithelial neoplasms, with carbon dioxide snow suggested for large hairy pigmented nevi and strawberry hemangiomas, and x-ray therapy for cavernous hemangiomas.

DISEASES OF THE SKIN—*Fifth of a Series*

Benign Tumors of the Skin

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Benign Tumors

ANY discussion of benign epithelial neoplasms requires some clarification of terms. While the term nevus usually implies a circumscribed growth of congenital origin, many regard as nevi other more widespread, diffuse hypertrophies and overdevelopments of some tissue elements (hamartomas) as well as certain cysts, so long as they are presumably congenital in origin. In this broader sense many nevi may appear later in life and multiple types may appear simultaneously in a given person or even in a single lesion.

There is no commonly accepted classification of many benign neoplasms, and it is therefore necessary to define the boundaries for discussion. From the practical clinical point of view, and aside from purely academic and precise histologic considerations, the most common benign tumors of the skin include hypertrophies such as warts and keloids, cicatrices, various types of cysts and nevi.

Warts—Verruca vulgaris or common wart is most frequently seen on the dorsa of the fingers and hands and on the soles of the feet in children and young adults. Usually it is easy to identify, but it is less obvious when it first appears as a pinhead-sized shotty translucent papule or as a thickened horny plaque adjacent to the nail or beneath its distal margin. On the soles, warts often are mistaken for calluses or foreign-body reactions until the horny plate has been removed and the fine bleeding points of hypertrophied papillae are observed.

In treatment of warts on the soles, if they are not too numerous or too close together and if they are less than 1 cm. in diameter, I still prefer properly administered unfiltered x-ray therapy given in a single dose of 2500 to 3000 r. I never use or recommend x-ray therapy for treatment of warts elsewhere than on the soles. The treatment of choice for warts on the hands is electrodesiccation or electrocautery and curettage. Application of liquid nitrogen is an acceptable form of therapy but not readily available. If neither of these methods is practical, one can remove the horny plate and paint the area with trichloroacetic acid and instruct the patient to apply 10 per cent salicylic acid and 10 per cent lactic acid in flexible collodion daily. This form of treatment usually is effective over a period of time.

Verruca plana or flat wart commonly is seen on the dorsa of the hands and on the face,

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particularly in children and young adults. The lesions may be confused with the flat papules of lichen planus but invariably are flesh-colored or light brown rather than violaceous. If involvement is extensive, local therapy generally is of little avail. Fulguration or cautery is to be condemned because of inevitable scarring. Internal medication consisting of BISTRIMATE® or mercury protiodide orally or bismuth by injection is often helpful.

Condyloma acuminatum, a moist papilliferous wart on the mucous surfaces of the genitalia, responds well to local application of trichloroacetic acid or 25 per cent podophyllum resin in alcohol.

Molluscum contagiosum is a variety of wart that is usually seen in children. The size varies from that of a pinhead to that of a pea. It has a shiny, pearly surface and a central dimple. Lightly piercing this central punctum with a sharp pointed applicator stick which has been dipped in trichloroacetic acid is a simple and effective method of treatment.

Cicatrices—A cicatrix is a growth of connective tissue which replaces normal dermal structures destroyed by trauma or disease. Common examples other than traumatic or surgical scars are pitted scars of acne and the striae cutis distensae on the lower part of the abdomen in multiparas or on the abdomen and thighs in persons who have repeatedly lost and gained considerable amounts of weight. Repair of cicatrices obviously depends on their type, extent and character.

Keloids—Keloids are hypertrophic scars, most commonly the result of burns, surgical procedures, or self-induced trauma to insect bites, acne pustules and other skin lesions. X-ray therapy generally is quite effective if applied within a few weeks to months following appearance of the lesion. Keloids of more than six months' duration do not respond favorably to this modality. Applications of carbon dioxide snow sometimes are useful in old, circumscribed lesions. Some workers have advocated local injections of hyaluronidase and hydrocortisone in conjunction with roentgen therapy.

Nodular subepidermal fibroma—This occurs as a single firm fibromalike nodule on the lower part of the leg, but there may be multiple lesions on the upper extremities and trunk as well. I have always felt that it is a small keloid which follows some incidental trauma to the skin. In my experience it is better left alone. Any attempt at surgical excision or electrosurgical therapy is likely to result in a more pronounced keloid.

Cysts—By far the most common cysts are either epidermal or sebaceous. Epidermal cysts arise as a result of trauma which causes a portion of epidermis to become invaginated into the dermis. Sebaceous cysts or wens usually are seen on the scalp, face, upper back and chest in persons who have excessively oily skin. Clinically the two types often are indistinguishable. In most instances the diagnosis of benign cyst is quite apparent, but if there is a small single papulocystic lesion, particularly on the face, one must not overlook the possibility of a cystic type of basal cell epithelioma. Multiple small cystic lesions, particularly on the face, neck and upper trunk, would suggest the possibility of some more unusual type such as steatocystoma multiplex, multiple benign cystic epitheliomas, or syringocystadenoma.

Treatment of epidermal or sebaceous cysts depends on such factors as location, size, and degree of acute inflammation or fluctuation. Small cysts that are rather intensely inflamed often respond well to filtered x-ray therapy. Larger, fluctuant cysts may be treated by surgical excision or a combination of incision, drainage and chemocautery or fulguration.

Seborrheic verrucae—Seborrheic verrucae are seen with increasing frequency after the age of 40 years. They occur on the face, neck and upper half of the trunk. Almost invariably there are multiple lesions. The lesions tend to be relatively flat and are somewhat rough, irregular or even granular and covered with a thin greasy scale. The color varies from light brown to almost black, and the lesion has the appearance of something foreign stuck on the skin surface. One may remove seborrheic verrucae by applying liquid nitrogen or by applying 25 per cent podophyllum resin in alcohol repeatedly. When treated with fulguration or cautery, they immediately become

mushy in consistency and can literally be wiped away.

Precancerous Dermatoses

Senile keratoses—Senile keratoses occur chiefly on exposed areas such as the face and neck and dorsa of the hands in persons more than 50 or 60 years of age. They are flat to conical and moderately elevated. The surface is rough, dry and harsh. The crust tends to be extremely adherent, and when it is removed the base of the lesion is moist and bleeds readily. The color varies from light brown to dark brown. Senile keratoses may occur on the face or dorsa of the hands as extensive flat, rough plaques. The lesions are definitely precancerous and should be destroyed electrosurgically. If a lesion is indurated and there is an inflammatory halo, one should take a biopsy specimen for microscopic examination to rule out malignant degeneration. In contradistinction to senile keratoses, arsenical keratoses tend to occur on the palms and soles.

Cutaneous horn—Cutaneous horns are uncommon hyperkeratotic growths which vary greatly in size and shape. The majority probably develop from senile keratoses and thus are subject to epitheliomatous change. Because they are precancerous, they should be surgically excised or destroyed electrosurgically, taking care to have the specimen examined microscopically to rule out malignant degeneration.

Leukoplakia—Leukoplakia of the buccal mucosa consists of discrete or diffuse thickened hyperkeratotic grayish-white plaques. Since malignant change eventually ensues in 20 to 30 per cent of cases of leukoplakia of the oral cavity, it is important to differentiate it from mucous patches of early infectious syphilis, lichen planus and lupus erythematosus. Diffuse glossitis accompanied by extensive leukoplakia on the tongue is almost invariably a late sequela of syphilis. Treatment consists of removing local irritants, abstaining from use of tobacco, and practicing good oral hygiene. If the lesions do not disappear with these simpler measures or if there is any suggestion of malignant degeneration, electrocautery, desiccation or surgical excision is indicated. X-ray therapy or use of radium needles is not recommended except in instances where malignant degeneration has been demonstrated microscopically.

Leukoplakia may affect the vulva during the menopause or shortly thereafter, and in this location one must differentiate it from kraurosis vulvae, lichen planus, lichen sclerosis et atrophicus, and moniliasis. Ulceration or fissuring in leukoplakic vulvitis should suggest the likelihood of malignant change. Surgical excision or complete vulvectomy is the treatment of choice. It should be re-emphasized that one should resort to such radical measures only after the correct diagnosis has been carefully established. When malignancy does supervene in leukoplakia, it is of the squamous cell variety.

Benign Epithelial Neoplasms

Pigmented moles—Pigmented moles vary greatly in size from those of pinhead size to uncommon ones covering large areas. They may contain little pigment or vary in color from light yellow to dark brown and even bluish-black. These moles are essentially of two types, the flat "junctional" type and the raised or even pedunculate type. The latter type frequently contains hair.

In the so-called junctional type there is microscopic evidence of activity of the pigment-producing cells at the epidermal-dermal junction. Ordinarily one need not remove this type of lesion. However, it sometimes gives rise to malignant melanoma, particularly when it is situated in an area subject to constant friction and trauma, such as the palm or sole.

The raised type of pigmented mole does not show junctional activity, but groups of nevus cells are seen in the dermis. The pigment-producing cells are inactive. It is a benign lesion and does not develop into malignant melanoma. Thus it is advisable to excise the flat type of pigmented mole surgically. The raised type may be treated by electrocautery or electrodesiccation. A good cosmetic result may be obtained by treating large hairy pigmented nevi with applications of carbon dioxide snow.

Occasionally one sees a case in which large

hairy pigmented nevi cover large areas on the trunk. With patience and persistence one can sometimes accomplish a great deal with a carefully planned combination of plastic surgery and repeated piecemeal applications of carbon dioxide snow.

Another type of pigmented fibrous nevus, also containing neural elements, is that seen in neurofibromatosis. This condition tends to be familial. It is readily diagnosed clinically by the presence of multiple soft, readily depressed fibrous outpouchings of the skin which may be few in number or be present by the hundreds or even thousands. Associated with these various-sized lesions there usually are one or more light brown macular plaques, the café au lait spots.

Pigmented nevi other than ordinary pigmented moles are blue nevi or Mongolian spots. Blue nevi are sharply defined lesions, slate gray to bluish-black in color. Mongolian spots vary considerably in color from light gray to bluish-black or mulberry. They tend to be lighter than blue nevi and appear as macular plaques. Both blue nevi and Mongolian spots may be seen in any location, but of course the majority of Mongolian spots are seen over the sacrum in Negro and Oriental infants.

Epithelial nevi—This category includes all nevoid conditions present at birth or appearing later in life in which hyperplasia of epithelial cells occurs without the presence of ordinary nevus cells. For practical purposes the most common example would be linear pigmented and verrucous nevi occurring as hyperpigmentations or warty growths in either streaks or patches. These may be localized or extensive. Nevus unius lateris often extends almost the entire length of the affected extremity. The smaller localized varieties may be improved by electrocautery or plastic repair.

Hemangiomas—From a practical standpoint in regard to treatment and prognosis there are basically four types of hemangioma: (1) Strawberry hemangioma is the most common variety; it is bright red and slightly raised, with a somewhat irregular, bumpy surface, akin to the surface of a strawberry. It responds well to applications of carbon dioxide snow. (2) Cavernous hemangiomas are more raised, soft, puffy and sometimes almost fluctuant on palpation. They tend to be light bluish or purplish in color. They occur most commonly on the face and scalp. In either of these locations, a hemangioma often proves to be a mixed type, both strawberry and cavernous. This variety responds well to x-ray therapy or the gamma radiation of the radium plaque. (3) The nevus vasculosus or capillary-type hemangioma is the light pink, perfectly flat, smooth lesion which most commonly occurs over the forehead, the bridge of the nose, and the nape of the neck. It is best left untreated, and often disappears spontaneously. Some workers feel that it sometimes responds to applications of radium. (4) The port-wine stain or nevus flammeus variety tends to be purplish-red, has an irregular outline, and may cover large areas of the face and scalp, including mucous membranes. The surface may be smooth or may contain scattered small nodules or warty elevations. Port-wine stains or marks are formed of blood vessels lined with an adult type of epithelium and do not respond to any type of radiation.

The controversy still rages as to whether or not hemangiomas should be treated at all. I definitely feel that all strawberry and cavernous hemangiomas on the face and scalp at least should be treated. I have seen some of these lesions grow very rapidly. Even if they should ultimately regress spontaneously, a great deal more disfigurement and scarring would result than if they were treated at an early stage of development. Many physicians still do not appreciate the importance of the time element in treating hemangiomas. The earlier these lesions are treated, the better the response, and hence scarring is kept to a minimum. In fact, by the age of six months often the endothelial cells of the blood vessels are mature and no longer respond to any type of therapy.

Spider nevus—This is a very common lesion in children and adults alike. The face is the most common site. A spider nevus or nevus araneus consists of a tiny pinpoint-sized to pinhead-sized bright red punctum, flat or slightly raised, often with numerous tiny wavy

telangiectatic tributaries radiating from the central point like spokes of a wheel. If one presses the central spot lightly with a wooden applicator stick the entire lesion blanches completely. Treatment consists of lightly desiccating the central punctum with gentle pressure using a fine electrolysis needle.

Pyogenic granuloma—The lesion of pyogenic granuloma is raised, soft and bright red, and often the surface is moist and bleeds easily and profusely when abraded. Size varies from pinhead to pea or lentil. It is seen commonly about the face in children. Treatment consists of electrodesiccation or cautery, preferably under local anesthesia, although chemical cautery with silver nitrate stick might be successful, as in treatment of any excess granulation tissue.

Comment

I have attempted to discuss briefly some of the more common benign hypertrophies and neoplasms of the skin which the general practitioner, pediatrician, internist and surgeon are likely to encounter in everyday practice. It is beyond the scope of this paper to include the more infrequently encountered epithelial and connective tissue neoplasms whose identity depends largely on detailed histologic study, such as adenoma sebaceum, multiple benign cystic epithelioma, syringoma, syringocystadenoma, cylindroma, calcifying epithelioma of Malherbe, neuroma, leiomyoma, myoblastoma, glomangioma and related vascular tumors, lymphangioma, and many others. Lipoma and fibrolipoma were not included because they are usually readily identifiable and generally excised by the surgeon and thus not generally considered as being within the scope of the dermatologist.

By way of summary, it would seem appropriate to review certain basic principles in dealing with benign neoplasms of the skin.

1. Assuming that you are dealing with a benign growth, remember that it is benign. There often are several different acceptable methods for treatment or removal of the lesion in question. Do not be too radical. Use the method with which you are most familiar and a technic in which you feel well qualified. Always be mindful of the final cosmetic result. Remember that the average patient will more readily accept a certain amount of scarring and disfigurement from the removal of a malignant or potentially malignant lesion.

2. Remember that in some persons keloids are likely to develop at the site of removal of even very insignificant lesions. By asking the patient to return in a month, one generally will be able to detect early keloid formation and treat it satisfactorily if one begins promptly. In general, women are particularly prone to the development of keloids on the chest.

3. If there is reasonable doubt in your mind as to the nature of a lesion, I would emphatically stress the conservative approach. Leave well enough alone and seek consultation with a qualified dermatologist.

This brings up the very real problem dealing with removal of lesions in general. When should one take a biopsy specimen for histologic study? An ever-increasing consciousness on the part of the public in regard to medicolegal matters has brought even more emphasis to bear on this question. Obviously there is no real answer. One must depend on his own best clinical judgment, being ever mindful of the possible consequences. One can hardly be expected to take a biopsy specimen of every little wart or skin tag that he removes. Such a procedure would hardly be practical for the physician or for the pathologist, nor would it be practical from the point of view of the economy of the patient. At the same time, one must remember that in a recent court case in California a verdict was returned in a patient's favor against a dermatologist who had removed an apparently innocuous lesion about a year earlier and had not subjected it to microscopic study. Later the patient was found to have carcinomatosis. It was argued that the lesion removed by the dermatologist might have been the primary lesion, and had it been examined it might have shown evidence of the malignancy at an early enough stage to allow curative therapy.

As a final note, therefore, do not be too quick to belittle the removal of an insignificant skin lesion. Even in so doing, there exists a certain calculated risk.

Self-help Devices:
Aids to Dressing

EDWARD W. LOWMAN AND HOWARD A. RUSK

Institute of Physical Medicine and Rehabilitation
and the Arthritis Self-help Device Office*

New York University-Bellevue Medical Center, New York

WHEN there is upper extremity disability with limitation of range of motion in the shoulder or the elbow or impairment of hand function, or a combination of two or all of these disabilities, selection of clothing is an important factor in facilitating dressing. Women should avoid all clothing, including brassières, that have closings in the back. Two-piece garments are easier to manage. Except for persons who use axillary crutches, the sleeves should be full.

How the garment is to be fastened should receive special attention. Zippers are easy to manage; buttons, if preferred, should be large with loose buttonholes. Wrap-around skirts, housecoats and coat dresses reduce the need for special fastening devices. Clip-on bow ties are much easier to manage than regular ties.

*Supported at the Institute by the Arthritis and Rheumatism Foundation.

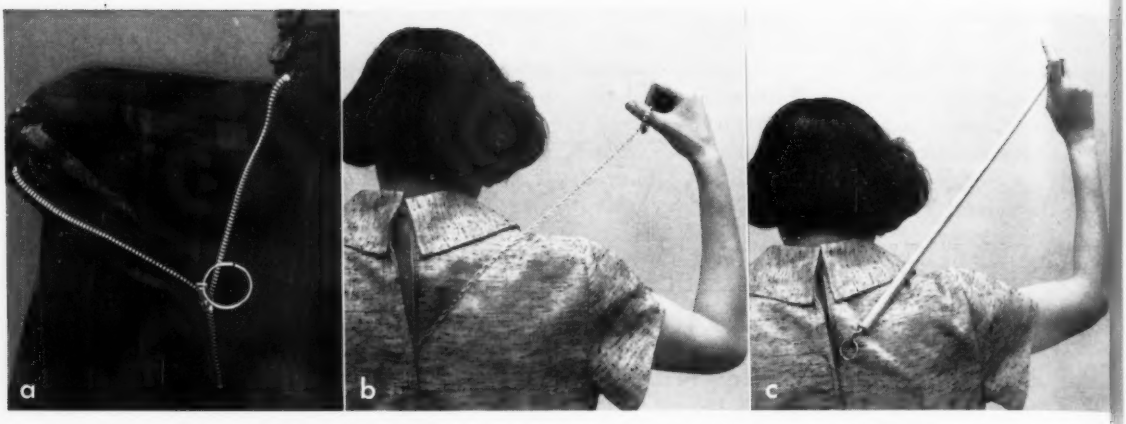


FIGURE 1a. If the head of the zipper slide is difficult to grasp, it can easily be built up by adding a fancy tassel, medallion or ring. b. If the zipper is full length and bending is a problem, the zipper can be pulled up by using an inexpensive device called Zipper-Her or Zipper-Upper. c. Adding a ring to the head of the zipper and using a dowel to which a common cup hook has been attached will also be helpful.

FIGURE 2. Hooped aprons eliminate tying apron strings.

FIGURE 3. For men, a loose sport shirt with short sleeves and open neck is especially practical when motion in the shoulders is limited. Both the right and left arms may be placed in the shirt sleeves and the shirt then slipped over the head. For those patients with one nonfunctional arm, it is best to slip the garment over the inactive arm first and then bring around and slip in the "good" arm.

FIGURE 4. In removing a shirt, a dowel with an attached closet hook may be used to push the garment off the shoulders, thus freeing it to drop down. The unit illustrated is one of the heads of the All-Purpose Stick, and it cannot be purchased separately. It can, however, be easily devised by cutting a dowel to the desired length and inserting a closet hook (*inset*).

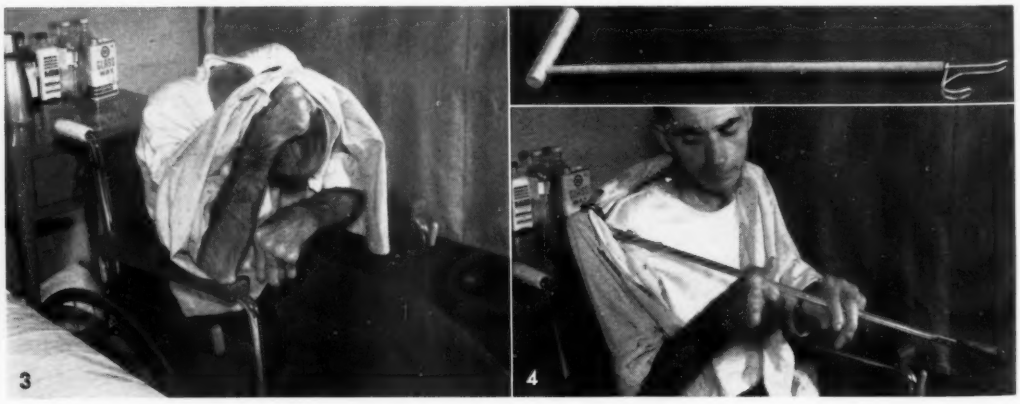


FIGURE 5. The four buttonhooks shown here were designed by an occupational therapist as special aids for persons unable to work a buttonhole over a button and vice versa because of loss of finger dexterity. The designs vary to meet the needs of differences in grasping ability.

a. For those who do not need a special handle for grasp.

b. For those who need a thicker surface for better grip; the treaded rubber covering gives good traction.

c. For those who have poor coordination or severely impaired grasp.

d. For fastening and unfastening the cuff of the "good" hand when there is only one functioning hand.

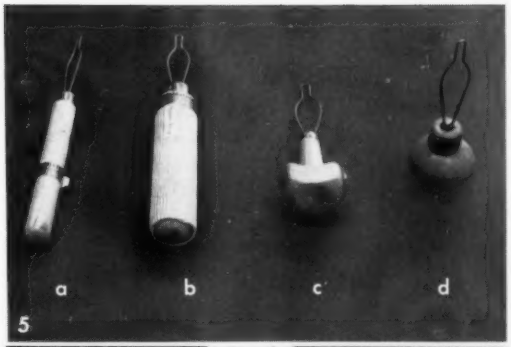
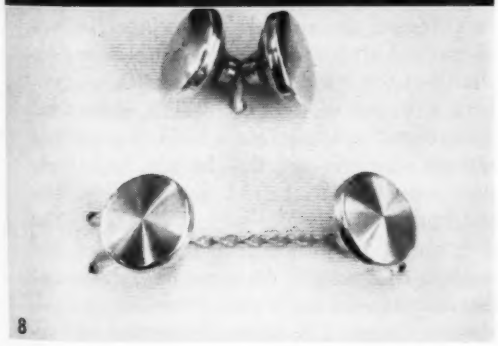


FIGURE 6. Unit c shown in figure 5 is best used wedged between the two fingers with the heel of the hand cupped over the one flattened edge. The designer points out that if dropped, the unit cannot readily roll out of reach.

FIGURES 7 and 8. If buttoning of cuffs is difficult, the button may be sewed on with elasticized thread; this allows sufficient give so that the hand can be slid through the prebuttoned cuff. French cuffs can be handled in a similar way. Illustrated in figure 7 are two buttons sewed together with elasticized thread, prefitted on the cuff, and the hand then worked through. The attractive stretchable cuff links (figure 8) may be purchased at Swank, 505 Fifth Avenue, New York, for approximately $5.00.



Functional Fashions will be highlighted in the next article. To meet the special clothing problems of the disabled, a number of distinguished persons in the merchandising field are currently participating in a research program to design fashionable but functional apparel within the range of the average pocketbook.

Readers are invited to submit suggestions and ideas for devices they have developed or know about and would like to share with others. Forward all such comments and suggestions to: Editorial Department, POSTGRADUATE MEDICINE, Essex Building, Minneapolis 3, Minnesota.

CLINICOPATHOLOGIC CONFERENCE

Report From Veterans Administration Hospital, Hines, Illinois

Edited by William J. Gillesby, M.D., Assistant Chief, Surgical Service

Case Report

A 66 year old white man was admitted to Hines Veterans Administration Hospital for the fifth time on December 2, 1957, with a 22 year history of multiple episodes referable to the gastrointestinal tract. His first admission was in 1935, nine months after his first attack of vomiting and abdominal pain, which was relieved by eating. This hospitalization followed five days of epigastric pain, vomiting of coffee-ground material, and tarry stools. The only pertinent history at that time was an appendectomy in 1916. A gastrointestinal series revealed a duodenal ulcer. The patient improved on medical management and was discharged in about two months.

Three years later, the patient returned to Hines, complaining of epigastric distress following meals, which was relieved by food or soda. X-ray again showed a duodenal ulcer. He also had a puffy, painful crusting lesion on his lower lip, which his local physician had treated with x-ray a few months before. The clinical diagnosis was postirradiation carcinoma, and the lesion healed with applications of gentian violet. After two months of medical therapy, the gastrointestinal symptoms again subsided, and he was discharged. He returned on December 15, 1939, after a few weeks of upper abdominal pain and distress following meals and 10 days of hematemesis and melena. At that time, he stated that he smoked to excess but did not drink. X-ray showed a deformed duodenal bulb and nonvisualization of the gallbladder. Once again he improved, and he was discharged within two months.

In March 1948, this patient was hospitalized elsewhere after an episode of epigastric pain and vomiting. Following this hospitalization, he had abdominal pain at night, which was relieved by food, milk or baking soda; he was readmitted to Hines on January 16, 1950. He became asymptomatic within two days after having been placed on a special gastric diet. He refused surgery for a papillomatous lesion on the skin over the abdominal wall, and was discharged in two weeks.

The fifth and final admission to Hines was from a private hospital, where this patient had been treated for abdominal pain and vomiting following symptoms of sneezing, wheezing and coughing of three weeks' duration. He was discharged after one week in the private hospital, but was readmitted there within a few days because of sudden severe abdominal cramps and vomiting. He said his bowels had become sluggish, and that he had had to remove some fecal material digitally. He then had had two normal bowel movements; the abdominal pain was subsequently relieved and the vomiting ceased. An x-ray of the chest at that hospital was reported to have shown "pulmonary fibrosis." A smear of sputum was re-

ported as negative for acid-fast bacilli. The symptoms of ulcer decreased except for pain. The cough continued and produced green sputum.

On admission to the tuberculosis service at Hines on December 2, 1957, the patient showed evidence of a recent weight loss; he appeared chronically ill and confused. Blood pressure was 130/90, temperature 98° F., and pulse 84. There was a healed depressed scar on his lower lip. Breath sounds over both posterior lung fields were diminished; otherwise, the chest and the heart were normal. The abdomen was flat, and there appeared to be moderate epigastric distress and slight tenderness in the right upper quadrant. There was no definite rigidity. The edge of the liver was nodular and nontender and was located five fingerbreadths below the right costal margin about 1 cm. inferior to the level of the umbilicus. The spleen and kidneys were not palpable, and there were no other masses. Bowel sounds were present and normal. Rectal examination revealed nothing abnormal, and the prostate was small and nontender.

Laboratory data—On December 3, a posteroanterior x-ray of the chest showed an extensive inflammatory infiltration throughout the right lung field; the many radiolucent areas seen might have represented cavitation. Pleural thickening had obliterated the right costophrenic sinus. The left lung field was essentially clear. Calcific plaques were noted in the aortic knob. These findings were considered to be consistent with pulmonary tuberculosis of the right lung with possible cavitations, although other inflammatory processes such as bronchopneumonia could not be excluded.

On December 5, a posteroanterior, right lateral decubitus view of the chest showed numerous densities connected by fibrosis over the entire right lung. A large nodule measuring about 2 cm. in diameter was found in the projection of the third anterior rib. A smaller nodule was seen in the second intercostal space. Translucencies which resembled bronchiectatic cavities surrounded the nodules in the region of the middle lobe of the right lung. Numerous other such translucencies also resembled cavities and possible bronchiectasis. The entire right side of the diaphragm was involved in the process toward the base of the lung. The left side was much less involved, but it showed similar peribronchial markings and possible bronchiectasis of the base of the left lung. One dense area was seen in the left infraclavicular region. The aorta was sclerotic and prominent. These findings were summarized as an extensive bronchopulmonary lesion in the right lung with numerous cavitations, probably of bronchiectatic-tuberculous character, and nodular infiltrations.

The gallbladder was fairly well outlined with opaque medium on December 9. It contracted well after a fatty meal. No radiopacity or radiolucency was shown; it was concluded that there were no significant abnormalities.

An examination of the chest on the next day revealed linear and patchy infiltrations involving almost all of the right lung; these were more marked in the middle two-thirds of the lung. There also was a suggestion of linear infiltration behind the left side of the heart. The decubitus films demonstrated fluid in the right side of the chest, and the right hemidiaphragm was slightly elevated. The heart was normal. Arteriosclerosis was noted in the aortic knob. A free-air series did not show evidence of free interperitoneal air. An obstructive series revealed a small amount of gas in the small bowel and a minimal amount in the ascending colon. No dynamic loops were seen. These findings indicated diffuse bronchial pneumonia involving most of the right lung and some lesser degree in the lower lobe of the left lung. The obstructive series was consistent with ileus, which was most likely secondary to a pneumonic process.

An electrocardiogram on December 5 was abnormal, showing nonspecific low voltage of the QRS complexes.

Laboratory data are summarized in table 1.

Hospital course—On admission, the patient was placed on a regimen for ulcer. Skin tests made two days after admission were reported as negative for histoplasmosis, coccidioidomycosis, blastomycosis and purified protein derivative No. 1. At a surgical consultation on December 10, blood pressure was 110/80, pulse 100, respirations 48. Examination of the

abdomen at that time revealed rigidity, with the greatest tenderness in the right upper quadrant. Bowel sounds were absent except for respiratory succussion splashes. There was dullness of the right side of the chest posteriorly, with rales and rhonchi. The patient was transferred to surgery, but he appeared moribund and no operation was performed. He died the next morning.

Discussion

RADIOLOGIST: The films of the chest showed a nodular and linear infiltrate involving the right lung; there also was some infiltrate in the left lung (figure 1). The apexes were relatively clear. These findings possibly indicated a spread of malignancy or miliary inflammatory disease.

DR. F. B. MONROE (senior resident, general surgery): It should be remembered that this patient's trouble began at age 44, when x-rays showed a duodenal ulcer; he was 66 years old when he died. At age 47, a lesion was removed from his lip, which later was ascribed to have been some type of carcinoma. It was not until the year of his death that sneezing, wheezing

TABLE 1

LABORATORY DATA

TESTS	DATES			
	12/4	12/6	12/10	12/11
Urinalysis				
Specific gravity	1.020			
Albumin	Negative			
Sugar	Negative			
Microscopic	Occasional white blood cells			
Hematology				
Hemoglobin (grams)	13.2		15.5	
Red blood cell count (millions)	4.42			
White blood cell count	12,500		23,000	
Polys	88		97	
Lymphocytes	12		3	
Sedimentation rate	14			
Hematocrit	42		49	
Serology	Negative			
Chemistry				
Alkaline phosphatase		35.9		
Thymol turbidity		2		
Bilirubin		0.9		
Direct		0.3		
Indirect		0.6		
Glucose	117			
Nonprotein nitrogen	31.6			
Blood urea nitrogen	12.5			
Total protein		5.6		
A-G ratio		3.6-2.0		
Carbon dioxide-combining power	17.6			
Chloride	103.5			
Sodium	141			139
Potassium	3.75			7.05
Cephalin-flocculation	Negative (24 to 48 hr.)			
Bacteriology				
Sputum and gastric contents	No acid-fast bacilli	No acid-fast bacilli	No acid-fast bacilli	No acid-fast bacilli
	Hemolytic *Staph. albus* and paracolon		Hemolytic *Staph. aureus*	
			Coagulase-positive	

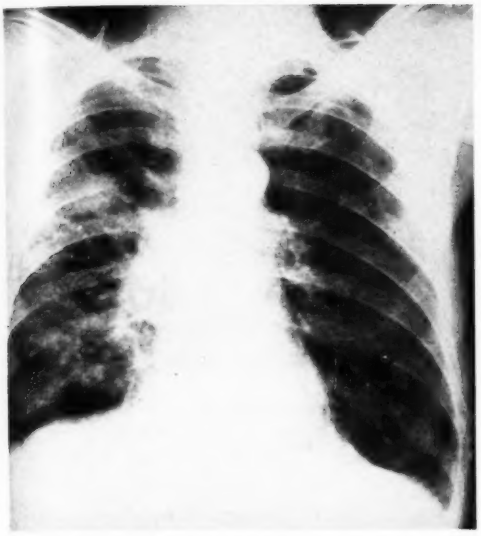


FIGURE 1. X-ray of the chest showing nodular and linear infiltrate in the right lung and infiltrate in the left lung.

and coughing developed. These symptoms might have been just a cold, or they might have been mentioned in the protocol only to lead us astray. The patient did have abdominal pain and vomiting throughout his long illness. The terminal course consisted of only nine days.

It might be brought out that the patient was afebrile at the time of the last admission. Subsequently, we were told that he had an elevated pulse and respiration, but never again was the temperature mentioned. It also was noted that on admission the liver was greatly enlarged and nodular. It is significant that an x-ray on December 10 showed fluid in the right side of the chest; in addition, the right side of the diaphragm was elevated. On that same day, the abdomen was rigid, with the greatest tenderness in the right upper quadrant. The specific mention of "greatest tenderness" would indicate that the entire area was tender.

I believe that the most significant laboratory findings were the elevated alkaline phosphatase and the marked elevation of the white blood cell count, especially of the polys. In very few conditions does one find 97 per cent polys. The potassium level was up, but that was noted on the day of the patient's death. Except for the essentially normal level of sodium, one might have suspected a hemoconcentration. The administration of potassium might have been a little too vigorous for the previous day or two. Another significant finding was the presence of hemolytic *Staphylococcus aureus* in the sputum. A pneumonia of that nature goes wild in short order.

In looking at the x-rays of the chest, I did not see the cavities as plainly as they were originally reported; they seemed to be more as they were described in this conference. After reviewing some of the data on the diseases of the chest that might give this appearance, it seemed logical to consider the pulmonary mycoses. Coccidioidomycosis would perhaps be the most likely to show something of this nature. This condition shows thin-walled cavities with paramount infiltration along the peribronchial areas; however, the skin test for coccidioidomycosis was negative. Actinomycosis, blastomycosis and nocardiosis could not be considered, and cryptococcosis would not produce an x-ray of this type. Eosinophilia was not shown on any of the data relating to blood counts.

For 22 years, this patient had considerable distress from symptoms which could have been referable to ulcer. In the late course of his illness, elsewhere and at Hines, he complained of abdominal cramps with vomiting. Ordinarily, cramps and vomiting do not go along with an ulcer. Of course, an ulcer can be obstructive, but patients with ulcer usually do not complain of cramps; they have a constant steady pain.

We also have to consider the findings in the chest and that the liver was markedly enlarged, below the umbilicus, hard, irregular, and nontender. The fact that the liver was nontender does not necessarily rule out any passive congestion; however, when the liver is acutely inflamed or shows extreme passive congestion, it usually will be tender. I think that there were malignant cells present in the patient's liver.

I believe that this patient had a carcinoid of the small intestine. The appendix had been

removed in 1916. Serotonin is said to be produced in clinical quantities only in those carcinoids that metastasize widely to the liver. Although this patient did not have symptoms of flushing, the intestinal symptoms could partly fit this picture. In addition, the respiratory symptoms of wheezing and coughing also could be partially consistent with this diagnosis. Suffice it to say, however, the level of serotonin is not enough to explain why the patient had a terminal ileus. It must be remembered that two days prior to his death the patient experienced intense pain in the right side of the abdomen and the epigastrium. On physical examination the tenderness appeared most marked in the area of the right upper quadrant.

I believe that the carcinoid of the small bowel had metastasized to the liver and possibly to the lung. The patient also had a peritonitis which was secondary to a perforation of the old ulcer. The ulcer probably also perforated into the pancreas with, possibly, a pancreatitis. In addition, there was a terminal staphylococcal pneumonia which was superimposed on metastatic disease of the lung.

Postmortem Findings

DR. M. E. RUBNITZ (chief of laboratory service): We have been accused in the past of finding all sorts of obscure and difficult things to present in these clinicopathologic conferences. Therefore, this time we decided to present something that was straightforward—with a little twist.

This patient described a recent weight loss before his last admission to Hines. In fact, at the time of his death, he weighed about 125 lb., which I believe was about 20 to 30 lb. less than his usual weight. When the peritoneal cavity was opened, it was obvious that this man had had a recent perforation of a viscus. We found 2000 cc. of fluid, in which there was a large amount of digested and some undigested food particles. The peritoneal surface also showed an acute exudate. The perforation was in the anterior portion of the duodenum. It had shown symptoms for 22 years, and there had been no attempt by the omentum to seal off this perforation. There also were some fluid in the right pleural cavity and some recently formed adhesions.

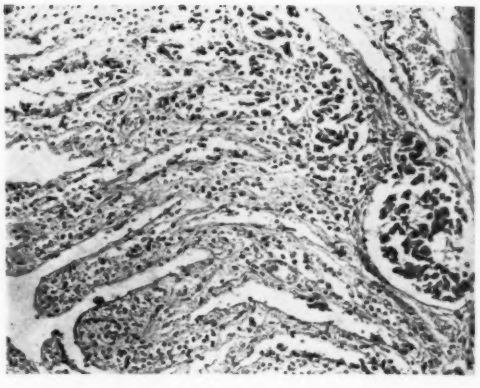


FIGURE 2. Section through normal colon near carcinoma showing vascular invasion by donor cells.

The nodules in the lung that were shown by x-ray were present. The reason for these nodules and those in the liver became obvious on examination of the large bowel. This patient had a carcinoma of the hepatic flexure of the colon. It was a typical mucinous carcinoma which affected almost three-fourths of the lumen. Associated grossly positive lymph nodes were seen in the mesenteric, periaortic and peribronchial regions, and nodes were present around the common bile duct.

A microscopic section through the duodenum in the region of the perforation revealed that rather than eliciting a marked response of *acute* inflammatory cells this inflammatory process seemed to show diffuse *chronic* inflammatory cells. Thus, it is obvious why the perforation of this long-standing ulcer did not seem to be on a recently acute basis. It was in no way connected with the tumor of the large bowel.

A section through the carcinoma showed characteristic mucinous material from a mucinous adenocarcinoma of the colon and dark-staining malignant tumor cells. This appearance of mucin is almost pathognomonic of mucinous carcinoma. After having observed a number of these, it is not even necessary to look for the cells, because this is typical of the material put out in a carcinoma of the colon.

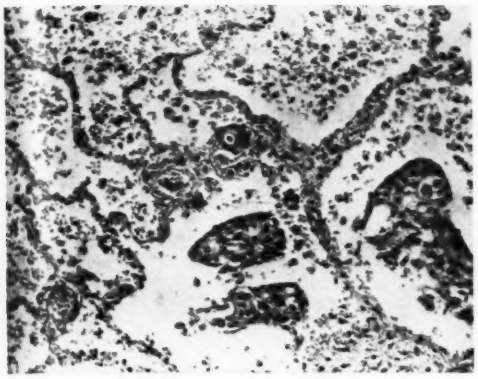


FIGURE 3. Section of the lung showing carcinoma in the tissue.

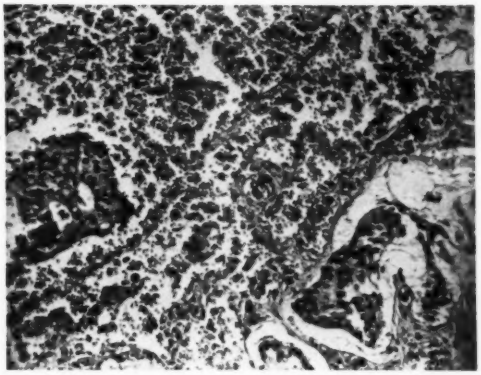


FIGURE 4. Section showing pneumonitis and carcinomatous involvement of the lung.

A section through the normal colon showed a vascular invasion by obviously malignant cells (figure 2); their presence is explained by the fact that this type of glandular element also was found in the lungs. This is probably either a blood vessel or a lymphatic vessel; endothelial cells are seen along the periphery. The patient had extensive infiltration of the lungs in the embolus of the tumor (figures 3 and 4).

With a 22 year history of ulcer, this patient was admitted to the hospital with cramps, and then obvious signs of some possible perforation of a viscus developed. In addition to the ulcer, he had a condition which accounted for the remainder of the symptoms. I also think that the nodular liver and the high alkaline phosphatase pointed to some type of metastatic tumor in the liver.

It is said that carcinomas in this area of the large bowel frequently are manifested by anemia, but this was not true in this case.

DR. I. E. KIRSH (staff physician, radiology service): I do not agree with all the statements that were made in the x-ray department about the roentgenograms in this case. I did not think that the chest films showed pulmonary cavities, and the abnormal shadows appeared to be nodular, which would suggest metastatic malignancy.

The nature of the abdominal emergency also was interesting to us in radiology. The distention of the intestine appeared to have been due to an adynamic ileus rather than to intestinal obstruction. Adynamic ileus may be caused by a variety of disease processes, including peritonitis. If this patient had a perforated ulcer, he, of course, had peritonitis.

I would like to comment on the reliability of x-ray examination in the diagnosis of ruptured peptic ulcer. A few years ago, I collaborated with Mann, Familaro and Eisen of the surgical service in a report on all cases of perforated ulcer that had been diagnosed at this hospital. All of the 173 patients with this condition had had adequate x-ray examination of the abdomen. We found that the greatest accuracy of diagnosis (85 per cent) resulted from a complete four-film examination, including views in the upright, left and right lateral decubitus positions, and a lateral film made with the patient supine. The percentage of positive diagnosis was lower when less than four films were made; only 75 per cent accuracy was achieved when a single film in the upright position was made. In this case, a complete examination was done.

It is understood that even under the best conditions we fail to find free air on the roentgenograms in 15 per cent of the cases. This usually can be explained by the fact that the perforation readily becomes sealed off, preventing escape of air from the stomach. We were told that this did not happen in this case.

Amino Acid Requirements of Man

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THE physician practicing in the United States is rarely confronted with a case of protein deficiency.[1] In fact, most American adults are subsisting on diets providing two to five times the minimal requirements for protein. In growing children, the margin of safety is by no means as great. There is little evidence, however, that even in children protein shortage is common in America, as is claimed by some authors.[2] Probably the only *large* groups in danger of being deficient in protein, as well as in calories and various nutrients, are young women and adolescent girls who place themselves on faddish reducing diets and attempt to lose weight without much justification and at an excessive rate.

Yet, at the same time, the problem of amino acid requirements is of relevance to the practicing physician. This is due to the fact that an increasing number of foods are fortified with amino acids or are sold to the public on the basis of their "high protein" value. In addition, administration of certain amino acids, such as methionine and glutamic acid, has been advocated in certain pathologic conditions. Actually, requirements for amino acids are quite different from requirements for vitamins and minerals. Essentially *minimal* amounts of the latter must be provided to avoid disease or to insure optimum performance, no matter what the rest of the diet may include. Granted, there is some relationship between these minimums and the composition of the diet. For example, a high carbohydrate diet increases the requirement for thiamine. A high protein diet decreases the requirement for nicotinic acid; the availability of a large amount of antioxidants (e.g., vitamin E) in the diet spares vitamin A, etc. Nevertheless, minimal requirements for such nutrients can be stated in tables of recommended dietary allowances[3] in terms of so many milligrams or grams per day without detailed reference to dietary composition.

The situation is quite different in regard to amino acids. While early work[4] stated daily amino acid requirements in terms of a minimum (in milligrams per day, sometimes multiplied by two to provide for a margin of safety and to yield an optimum daily requirement), it has come to be realized[5] that such an approach was erroneous. When no less than

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TABLE 1

CLASSIFICATION OF THE AMINO ACIDS WITH RESPECT TO GROWTH EFFECT IN THE RAT

ESSENTIAL	NONESSENTIAL
Lysine	Glycine
Tryptophan	Alanine
Histidine	Serine
Phenylalanine	Cystine†
Leucine	Tyrosine‡
Isoleucine	Aspartic acid
Threonine	Glutamic acid
Methionine	Proline
Valine	Hydroxyproline
Arginine*	Citrulline

*Arginine can be synthesized by the rat but not at a rate sufficient to fulfill the requirements for maximal growth. It is thus really in an intermediary status and can be classified either as essential or as nonessential, depending on definition.

†Cystine can replace about one-sixth of the methionine. It has no growth effect in the absence of methionine.

‡Tyrosine can replace about one-half the phenylalanine. It has no growth effect in the absence of phenylalanine.

the minimum or the optimum of a given amino acid has been administered, it is still possible to throw the subject into negative nitrogen balance by administering relative excesses of other essential amino acids. In other words, when dealing with amino acid requirements, we are dealing with the need for a *pattern* of essential amino acids. (For that matter, the pattern of nonessential amino acids also may exert some influence.) There is thus no contradiction between the statement that the protein intake of most Americans is much higher than is required and the statement that the problem of amino acid requirements may be of clinical importance even in the United States.

The Concept of Essential Amino Acids

The concept of essentiality of amino acids, i.e., the fact that there are amino acids which the body cannot synthesize and which therefore must be provided by the diet, dates back to the demonstration by Willcock and Hopkins in 1906 that rats cannot grow on a diet devoid of tryptophan. Two other pioneers, Osborn and Mendel, working at Yale, demonstrated that the amino acid composition of proteins determines their biologic value, i.e., their value as a source of protein for growth of experimental animals. It is, however, to Rose[4] that we are indebted for a clear and detailed knowledge of indispensable amino acids. He perfected a technic of substituting purified amino acids for protein in the diets of experimental animals and testing, by omitting one amino acid at a time, whether growth stopped and maintenance became impossible. If growth stopped, the amino acid was essential for growth. If maintenance became impossible, the amino acid was indispensable for maintaining the adult state as well. The work was held up for a number of years by the finding that no known mixture of synthetic amino acids could replace a casein hydrolysate for the growth of rats. Finally, in 1934, this baffling situation was cleared up by the isolation in pure form of a missing amino acid, threonine.[6] Considerable work over the years led to the demonstration that certain amino acids could be classified as essential and nonessential for the rat (table 1).[7]

Essential Amino Acids in Man

Rose and associates[4, 8, 9] attacked the problem of amino acid requirements in adult man by using mixtures of pure acids as the source of nitrogen in diets. As in the animal studies conducted by Rose, one or more of the amino acids were omitted. The maintenance of nitrogen balance was used as the criterion of essentiality of amino acids. It was thus shown that valine, methionine, threonine, leucine, isoleucine, phenylalanine, tryptophan and lysine are essential. The removal of histidine and of arginine did not lead to negative nitrogen balance. It thus appears that these two amino acids are not essential in adult man. The problem of elucidating the nature and the daily need of essential amino acids in infants was undertaken by Holt and Snyderman.[10] Many groups of investigators[11-14] have studied this problem in women. In spite of the existence of a considerable body of information thus available, the following limitations to our knowledge must be recognized.

1. The number of subjects used in each experiment, whether adult men or women or

TABLE 2

AVERAGE MINIMAL REQUIREMENTS FOR ESSENTIAL AMINO ACIDS[5]

SUBJECTS	AVERAGE MINIMAL NEEDS (*Milligrams per kilogram of body weight*)									
	Isoleucine	Leucine	Lysine	Phenyl-alanine	Sulfur-containing acids			Threonine	Tryptophan	Valine
					Methionine	Cystine	Total			
Men	10.4	9.9	8.8	4.3*	1.5	11.6	13.1	6.5	2.9	8.8
				13.3†	13.2	0	13.2			
Women	5.2	7.1	3.3	3.1‡	4.7	0.5	5.2	3.5	2.1	9.2
					3.8	(2.2)	6.0			
					3.4	3.4	6.8			
					3.0	(4.2)	7.2			
Infants	90	—	90	90§	85	0	85	60	30	85
					65	Present	—			

*15.9 mg. tyrosine per kilogram; ratio of tyrosine to tryptophan equals 5.5.

†No tyrosine.

‡15.6 mg. tyrosine per kilogram; ratio of tyrosine to tryptophan equals 7.4.

§Tyrosine present.

infants, was necessarily small. We have thus only limited knowledge of the extent of individual variability in amino acid requirements in man. Data on amino acid excretion suggest that this variability may be appreciable.

2. We have no experimental data on requirements between infancy and adulthood. In particular, we do not know whether the prepuberty growth spurt is accompanied by any qualitative changes in amino acid requirements, an unlikely but by no means impossible eventuality.

3. No explanation is available for the fact that when essential amino acids were fed as pure substances in experiments to determine the amounts required in the diet, it was necessary to provide calories far in excess of normal requirements to obtain nitrogen balance. This was particularly true in Rose's experiments in adult men.

4. The interrelationship among amino acids is such that requirements for one are influenced by intakes of others. The minimal values obtained when one amino acid is dropped from the mixture fed the subject and its intake gradually built up until nitrogen balance is reached are of necessity a function of the intake of the other essential amino acids. For example, while it has been generally thought that imbalance among amino acids was unlikely to occur when only natural foods were ingested, it has been recently shown[15] that the amount of leucine in corn may be large enough to increase the requirements for isoleucine.

5. The human requirements for amino acids are obviously influenced by a number of additional factors, such as the caloric value of the diet, the sparing of protein by carbohydrate and fat, and the timing of the intake of foods containing proteins.

6. The experiments mentioned were carried out under experimental conditions designed to spare the essential amino acids from the need to contribute to the synthesis of the nonessential amino acids. Unless the latter are in ample supply, the need for essential amino acids will be increased. For example, under experimental conditions in which low levels of protein intake are obtained from milk, certain nonessential forms of nitrogen are limiting, and the need to synthesize these creates a demand beyond the minimal requirements.[10] Generally speaking, in man as in experimental animals, the pattern as well as the amount of nonessential amino acids may be of importance.

7. Finally, in man as well as in experimental animals, the ability of the nonessential amino acids cystine and tyrosine to spare, respectively, much of the required methionine

TABLE 3

PATTERN OF ESSENTIAL AMINO ACIDS WHEN REQUIREMENTS ARE EXPRESSED IN RELATION TO TRYPTOPHAN[5]

SUBJECTS	AMINO ACID REQUIREMENTS *(Milligrams per kilogram of body weight)*									
	Isoleucine	Leucine	Lysine	Phenyl-alanine	Sulfur-containing acids			Threonine	Tryptophan	Valine
					Methionine	Cystine	Total			
Men	3.6	3.4	3.0	(1.5*	0.5	4.0	4.5)	2.2	1.0	3.0
				(4.6†	4.6	0	4.6)			
Women	2.5	3.3	1.6	1.5‡	(2.2	0.3	2.5)	1.7	1.0	4.4
					(1.8	[1.0]	2.8)			
					(1.6	1.7	3.3)			
					(1.4	2.0	3.4)			
Infants	3.0	—	3.0	3.0§	(2.8	0	2.8)	2.0	1.0	2.8
PROVISIONAL PATTERN	3.0	3.4	3.0	2.0‖	1.6	1.4	3.0	2.0	1.0	3.0

*15.9 mg. tyrosine per kilogram; ratio of tyrosine to tryptophan equals 5.5.

†No tyrosine.

‡15.6 mg. tyrosine per kilogram; ratio of tyrosine to tryptophan equals 7.4.

§Tyrosine present.

‖Assumes about 5.0 mg. per kilogram of tyrosine; ratio of tyrosine to tryptophan equals about 2.0.

and phenylalanine is of relevance in determining requirements for these two essential amino acids.

The FAO Provisional Pattern of Human Amino Acid Requirements

The international committee which met in 1955 in Rome under the auspices of the Food and Agriculture Organization of the United Nations to draw practical recommendations concerning protein requirements was struck by the fact that while the amounts of essential amino acids found by various investigators to be needed by men, women and infants varied considerably (table 2) the pattern of requirements for each amino acid in relation to the others was much more constant. In particular, we noted that if the amount of tryptophan, for example, found to be required in the experiments cited was taken as a unit and the proportion of other amino acids given in table 2 was recalculated to give the pattern shown in table 3, the variability of amino acid requirements was considerably reduced. That this reduction in the variability was not simply an artifact of presentation is confirmed by the repeated demonstrations of the interrelationship between requirements for the various amino acids. Another indication of the value of this approach is the remarkable similarity between patterns of human requirements and the patterns of essential amino acids in the proteins of high biologic value (eggs, meat, milk, etc.), i.e., those proteins found to be the most efficient at fulfilling human requirements.

It thus appeared reasonable to the members of the FAO committee to express amino acid requirements in terms of an ideal proportion of essential amino acids, using their collective judgment to evolve such a provisional pattern on the basis of results of determinations of amino acid requirements in man. Table 4 describes this provisional pattern in terms of grams of the essential amino acids per 100 gm. of protein and of milligrams of essential amino acids per gram of nitrogen. In both cases, a balance between essential and nonessential amino acids in the total protein has been arrived at by determining arbitrarily that the proportion of tryptophan is the same for the protein corresponding to the provisional pattern as it is for cow's milk. Table 4 also gives, in addition to the proportions of essential amino acids in the provisional pattern and

TABLE 4

ESSENTIAL AMINO ACIDS IN PROVISIONAL PATTERN AND MILK AND EGG PROTEINS[5]

AMINO ACIDS	PROVISIONAL PATTERN		COW'S MILK		HUMAN MILK		EGG	
	Per 100 gm. protein	*Mg. per gm. nitrogen*	*Per 100 gm. protein*	*Mg. per gm. nitrogen*	*Per 100 gm. protein*	*Mg. per gm. nitrogen*	*Per 100 gm. protein*	*Mg. per gm. nitrogen*
Isoleucine	4.2	270	6.4	407	6.4	411	6.8	428
Leucine	4.8	306	9.9	630	8.9	572	9.0	565
Lysine	4.2	270	7.8	496	6.3	402	6.3	396
Phenylalanine	2.8	180	4.9	311	4.6	297	6.0	368
Tyrosine	2.8	180	5.1	323	5.5	355	4.4	274
Sulfur-containing acids								
Total	4.2	270	3.3	211	4.3	274	5.4	342
Methionine	2.2	144	2.4	154	2.2	140	3.1	196
Threonine	2.8	180	4.6	292	4.6	290	5.0	310
Tryptophan	1.4	90	1.4	90	1.6	106	1.7	106
Valine	4.2	270	6.9	440	6.6	420	7.4	460

in cow's milk, the proportions in human milk and eggs, two other superior sources of protein. It is readily seen that the relative requirements estimated by the FAO committee were somewhat below the proportion of essential amino acids in human milk and eggs. The relative need for sulfur-containing amino acids was judged to be somewhat higher than their relative content in cow's milk.

Practical Applications of These Concepts

The provisional amino acid pattern is being used by FAO and other international agencies concerned with the feeding of populations as a guide for supplementing protein-poor diets. For example, table 5 was used by the FAO committee to show how the pattern can be utilized to plan supplementation of an all-vegetable diet. If 80 per cent of the protein of the diet is provided by corn and 20 per cent by navy beans, the diet is markedly deficient in tryptophan and somewhat deficient in sulfur-containing amino acids and lysine. Increasing the proportion of beans improves the lysine content but does little to increase tryptophan and reduce the sulfur-containing amino acids. If sesame seed is added, however, the pattern is considerably improved. The lysine and sulfur-containing amino acids contents are satisfactory by then, and the tryptophan content is considerably increased. In practice, before such supplementations are recommended on a mass basis, the results of such calculations should be tested by determinations of the resultant biologic value in experimental animals and, if possible, in human subjects.

The United States Department of Agriculture[16] has compiled tables giving the amino acid content of foods. These were established for 316 items and expressed in amino acids per gram of total nitrogen in edible proteins of foods and in amino acid content per 100 gm. of edible protein. The amino acids determined were: tryptophan, threonine, isoleucine, leucine, lysine, methionine, cystine, phenylalanine, tyrosine, valine, arginine, histidine, alanine, aspartic acid, glutamic acid, glycine, proline and serine. The tables give the values found for the maximal, minimal and average contents in samples of each item.

The Commonwealth Bureau of Animal Nutrition (Great Britain)[17] also published a compilation of amino acid contents of foods and foodstuffs. The availability of such tables makes it possible to calculate the protein score of a given foodstuff or diet. This protein score is the percentage of relative requirement furnished by the food material for the amino acid found to be most deficient in that particular food or diet when compared with the provisional pattern. In other words, the protein score measures the extent to which a food or food combination supplies the limiting

TABLE 5

AMINO ACID PATTERN AS A GUIDE TO SUPPLEMENTATION[5]

AMINO ACID	PROVISIONAL PATTERN	CORN PROTEIN		NAVY BEAN PROTEIN		SESAME SEED PROTEIN		80% CORN PROTEIN + 20% NAVY BEAN PROTEIN		50% CORN PROTEIN + 50% NAVY BEAN PROTEIN		40% CORN PROTEIN + 30% NAVY BEAN PROTEIN + 30% SESAME PROTEIN	
		Quantity	*Per cent*	*Quantity*	*Per cent*	*Quantity*	*Per cent*	*Quantity*	*Per cent*	*Quantity*	*Per cent*	*Quantity*	*Per cent*
Isoleucine	270	293		358		300		306		325		315	
Leucine	306	827		541		500		770		684		643	
Lysine	270	179	66	460		159	59	235	87	320		257	95
Phenylalanine	180	284		347		460		297		316		356	
Tyrosine	180	385		245		244		357		316		301	
Sulfur-containing acids													
Total	270	197	73	126	47	317		183	68	162	60	212	79
Methionine	144	117	81	64	44	181		106	74	91	63	120	83
Threonine	180	249		274		182		254		262		236	
Tryptophan	90	38	42	58	64	93		42	47	48	53	60	67
Valine	270	327		379		216	80	337		353		309	

Quantities are given as milligrams of amino acids per gram of nitrogen; also shown are the percentages by which the individual foods and mixtures of these foods fail to meet the levels of amino acids in the provisional pattern.

amino acid as compared with the provisional pattern. For example, in table 5, navy beans are seen to contain 126 mg. of sulfur-containing amino acids per gram of nitrogen, while the provisional pattern provides 270 mg. per gram of nitrogen. The protein score for navy beans is therefore $126/270 \times 100 = 47$. Actually, biologic values of 46 have been reported for navy beans with human test subjects. That such precise concordance cannot be expected for each food is due to the inaccuracy of our knowledge of the amino acid requirements in man and of the amino acid composition of foods and to the partial unavailability of amino acids in certain poorly digested foods. Results are good enough to suggest, as a rough guide, that foods and food mixtures with a protein score or a biologic value of 60 or less are unsatisfactory for growth and maintenance, and that a protein score of 70 or more is required for growth.

In the United States, the chances are small that any adult who is receiving a calorically adequate diet could be deficient in protein or in specific amino acids. Certain groups, however, are vulnerable: chronic alcoholics, who receive much of their caloric intake from alcohol and are thus on a low vitamin, low mineral and low protein diet; aged persons who are poor and live alone, some living on a simplified diet of bread and tea; and, as mentioned previously, young women and adolescent girls on faddish reducing diets, some of which have entailed subsisting on a protein intake as low as 15 or 20 gm. a day. Children of various ages who, due to economic circumstances and lack of proper supervision, may elect to subsist on such foodstuffs as dry cereal and pop are another vulnerable group. As a result, such groups not only are on low protein diets but also are generally on diets of low protein quality. An example of imbalanced amino acid composition is found in corn protein, which is notoriously low in lysine and tryptophan and too high in isoleucine. The heat treatment to which corn is submitted in the production of breakfast cereals further lowers the lysine content. The fact that the combination of corn cereals and milk has an acceptable protein value is of little help in the case of

small children who eat such cereals by the handful and who either do not drink milk or drink it at an altogether different period of the day. Only children with an otherwise quite deficient diet are likely to be seriously injured by such practices.

The fact that, small as they may be, there are groups of people even in this country who may be adversely affected by an unfavorable amino acid balance makes it not unreasonable to consider enriching deficient foodstuffs with synthetic amino acids; in any case we should use the mutually supplementary effect of proteins of different sources to achieve a balanced amino acid ration at each meal. There may well be situations in poor countries where supplementation of the staple foods with synthetic amino acids (e.g., corn with lysine) would be a useful short-term solution. On the other hand, at least so far, the use of large amounts of single amino acids as a *nutritional* adjunct in certain diseases has not proved of any value. Specific examples of such failures are the use of methionine in cirrhosis[18] and of glutamic acid in mental retardation.[19] Whether certain single amino acids turn out to be of use as *pharmacologic* agents in acute conditions, e.g., cystine in recovery from irradiation[20] or glutamic acid[21] and arginine[22,23] in lowering ammonia in the blood in acute hepatic disease, requires further evaluation.

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Editorials

Postgraduate Medicine

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CONTROLLED CLINICAL TRIALS

A CONFERENCE on controlled clinical trials, organized by the Council for International Organizations of Medical Sciences, was held recently in Vienna. The conference was supported by a grant from the Wellcome Trust and the Oesterreichisches Bundesministerium fur Soziale und Verwaltung. The chairman was Professor A. Bradford Hill of England; a considerable group of observers and listeners attended. Practically all of the papers presented were British in origin and have been issued as a pamphlet by the Council, the offices of which are in the UNESCO Building, 2 Place de Fontenoy, Paris 7.

One of the subjects discussed concerned the ethics of controlled clinical trials; this discussion involved the selection of patients and raised the question as to whether or not it is ethical to administer anything less than what the physicians consider absolutely best under the circumstances. Other subjects considered were the technics of constructing comparable groups; reports of some studies made on antihistaminic drugs in the treatment of the common cold, sore throat, pulmonary tuberculosis and rheumatoid arthritis; and the question of handling the patient as his own control and how to assess several treatments concurrently. The long-term administration of anticoagulants for myocardial infarction and clinical trials in cancer were also discussed.

Considering the present status of therapy, this conference was of the greatest importance. We are understanding more and more about the way in which the patient's mental attitude affects the results of various methods of treatment. Double-blind tests and similar technics are important in securing accurate data.

In the consideration of ethics, attention was called to Dr. Scadding's golden rule; namely, that a trial of a drug is not ethical unless it is designed so that the physician would allow himself or a close relative to be included in the trial. The discussions emphasized that the alternative to a controlled therapeutic trial on a group of patients is a series of uncontrolled trials on a succession of patients. There is no evidence that the alternative is safer than the controlled trial; from the evidence that is available relative to gold therapy in rheumatoid arthritis and to cinchophen in gout, alternative methods are not as safe.

The papers presented in this symposium were most instructive, particularly in relation to the specific diseases that were discussed. A careful reading indicates that the evaluation of results is one of the most difficult tasks that confronts the analyst, biometrician or statistician. Certainly the statistician should have a knowledge of medicine sufficient to comprehend the nature of the experiment.

In his concluding remarks, Sir George W. Pickering, Regius Professor of Medicine at Oxford University, emphasized that controlled clinical trials go beyond the evidence that comes from pharmacologic departments. He contrasted our knowledge of the antituberculotic drugs which was obtained by careful planning of treatment with the clinical impressions of other drugs not submitted to similar trial. Concluding his remarks, Professor Pickering said, "A controlled clinical trial is a cooperative undertaking and the result of the work should be published anonymously. The vast amount of effort that everybody puts into these controlled trials earns them no place at the top of a paper. Therefore, in some countries this might be regarded as a hindrance to the academic and professional progress of those taking part in the trial. That, I think, is a very important thing to be recognized. A controlled clinical trial is the quickest way to get knowledge; it has improved enormously the good fellowship amongst doctors, and has to my way of thinking an undoubted educational value."

MORRIS FISHBEIN

GEOGRAPHICAL PATHOLOGY

UNDER the auspices of the Council for International Organizations of Medical Sciences, a study group met recently to consider the problems and methods of geographical pathology. The report subsequently published was edited by Dr. Richard Doll,[1] who is in the statistical research unit of the British Medical Research Council.

The study group was concerned with the gradual changes that are taking place in the incidence of infectious diseases and in the increase of the diseases of the middle or later years of life, such as various forms of cancer, coronary thrombosis, hypertension, rheumatoid arthritis, diabetes, and cardiorespiratory insufficiency, commonly called chronic bronchitis. One way of studying the various factors involved in changes in the incidence of disease is to determine the geographical distribution of diseases throughout the world and the relationship of disease to special conditions that prevail in different countries.

Geographical pathology is defined as the comparative study of the incidence of disease and the distribution of physiologic traits in peoples of different communities throughout the world and the correlation of these data with features of the social and geographical environment. Already, much has been learned about the incidence of different diseases among populations in the same country, as well as differences in incidence in different countries. The mortality from cancer of the stomach is four to five times greater in Japan, Finland and Iceland than among the white population of the United States. In Indonesia, cancer of the stomach is several times more frequent among the Chinese living there than among the native Javanese. No satisfactory theory or explanation has been offered to account for these differences.

At present, little information is available about the relative incidence of congenital malformations in different areas. Comparisons need to be made among various differing ethnic groups. Congenital malformations are defined as anatomic defects which occur during the period of embryogenesis. These malformations include not only minor conditions such as webbed toes, supernumerary nipples and hemangiomas but also extensive serious physical handicaps. Some malformations which are present at birth are not usually detected until later in life. Among these are polycystic kidneys and congenital dislocations of the hip. The study group recommended that investigation be limited to the incidence of a group of selected malformations which are readily diagnosable at birth or shortly thereafter. These include conditions such as harelip, imperforate anus, mongolism, spina bifida, hypospadias, clubfoot and anophthalmia. The proportion

of abnormalities among stillborn children is greater than that among live-born children. Detailed anatomic studies should be made of all stillborn children. In 1956, the World Health Organization published an analysis of deaths attributed to congenital malformations.

The National Foundation in the United States is now making congenital malformations its main subject of interest and is proposing to hold an international congress dealing with this subject and with viral diseases in London in August 1960. Many new facts are being discovered about the distribution of various congenital abnormalities.

In concluding the report, Dr. Doll remarked that the climate of opinion is favorable to international research, and in recent years the possibilities for cooperation have greatly increased. He expressed the hope that funds for research in the geographical pathology of disease will become available on a large scale. Already, the bill for the establishment of an international research agency has passed the United States Senate by a considerable vote; conceivably, action may be taken that will give aid to such a project from the funds to be expended under this bill. If answers to some prevailing questions concerning such unsolved problems as mongolism and multiple sclerosis can be found, the expenditure of funds will be more than warranted.

MORRIS FISHBEIN

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SOME PROBLEMS OF GERONTOLOGY

The United States has a population of 175 million of which 15 million are more than 65 years of age. Population experts[1] say that the number will increase to 16 million by 1960 and to 21 million by 1975. Life expectancy at birth has increased from some 45 years in 1900 to about 68 years for men and 73 for women in 1958. Although the reasons for the increased life expectancy of women over that of men are not definitely determined, one argument has been that women take better care of themselves than do men. Women see their physicians more often, making 5.5 visits per year in contrast to 3.9 visits by men; after 65 years of age women make 7.6 visits per year in contrast to 5.8 visits by men. Attention is also called to the fact that twice as many men as women die of heart disease in the age period 40 to 74. Some attempts have been made to argue that men in general have higher metabolic rates than do women. In Florida, Dr. Wilson T. Sowder, health officer, has a project called the Fragile Male Project, in which he is endeavoring to find out why men die sooner than do women.

Among the hazards of old age, falling is of special concern. This may be associated with the failure of hearing and vision and the appearance of vertigo. Sixty-six per cent of people fail in hearing by 80 years of age, and 90 per cent of those more than 65 years of age need to wear glasses. Forty per cent of men and 75 per cent of women have vertigo by age 80. Moreover, 90 per cent of women and 65 per cent of men seem to have some difficulty getting around in the dark. The exact relationship of these difficulties to the incidence and the occurrence of cataract is not yet a matter of record. Moreover, as people get older, their reaction time becomes slower. They have difficulty making decisions. In crossing streets, the question of when to cross may be a matter of great importance in relationship to accidents in traffic. Finally, it is known that the human intellectual capacity increases up to the age of 35 or 40; after 40, impairment with age is greater in the less intelligent rather than in the more intelligent persons. Previously learned material interferes with new learning, and performance among the aged decreases with new tasks.

The most notable general effect of senescent change is increased fatigability. People may feel well on arising in the morning, but after the simple tasks of finishing the morning toilet they may be so exhausted that they need extra rest. A rest after luncheon may be exceedingly

useful in regaining strength. As men grow older, they find that the length of the golf drive is shortening and that the three miles of walking involved in playing 18 holes of golf is most fatiguing. For many of them this will mean playing 9 holes rather than 18 and perhaps using a golf cart, since outdoor air and a certain amount of exercise are beneficial to the general health, and, in fact, are prescribed by many cardiologists as useful for the heart.

Finally, in our modern age much attention is being paid to the effects of stress. Dr. Hans Selye has said that the impairment with age is real, but that the results are not necessarily serious as long as internal and external stresses are reduced in proportion to the diminished adaptive capacities of the aged. Much can be done in preserving the functions of the elderly if more attention is paid to the maintenance of high levels of mental and physical activity.

Dr. Trevor H. Howell,[2] attending physician to Queen's Hospital in Croydon, England, has classified the aged into three groups—the healthy, the sick and the infirm. Few institutions provide care for all three of these classes; most of them cater either to the healthy or to the sick. Those who are partially restored to health are dismissed to their usual residences. Neither the nursing homes nor the homes for the aged are adapted to the care of the elderly infirm.

Dr. Howell says that infirmity is the intermediate stage between health and sickness. Emphysema, osteoarthritis, hypertensive heart disease and cerebral arteriosclerosis make a normal independent life increasingly difficult without assistance. However, infirmity does not necessitate permanent residence in a hospital. The solution, he believes, might be accommodation of the infirm in homes for the aged sick or in places which he calls "half-way houses." These institutions would take frail, ambulant old people from hospital wards as soon as they are fit for convalescence. Medical care and some degree of nursing supervision would be provided. Many of these people would then improve sufficiently to go home or to a nursing home. Only a few would have to go back to the hospital because life without nursing service would be impossible. Such institutions would succeed only if the patients could be sent to hospitals without delay in cases of sudden illness or mental breakdown.

Dr. Howell offers, moreover, some important considerations relative to the clinical problems of treating elderly patients. The quality and quantity of the medical staff are important. One physician can hardly care for more than a maximum of 100 elderly patients. More important are the quality and quantity of the nursing staff. Even the most competent doctor cannot produce good results in a hospital ward without intelligent nurses. The nursing of old people is not an attractive vocation. For this reason, many nursing homes and geriatric wards are understaffed. Indeed, this same shortage makes nursing homes incapable of coping with minor ailments, and old people who merely have constipation with mild abdominal discomfort, slight dizziness, or mild cardiac edema must be admitted to hospitals. Social workers, physical and occupational therapists and radiologists can make a tremendous difference in the well-being of elderly people. The management of such patients, particularly their rehabilitation, demands teamwork and the assistance of auxiliary services which are scarce.

Finally, Dr. Howell offers some specific suggestions as to the location and qualifications of places which house the aged. "The buildings should be easily accessible and not too far from the daily life of the district. Bus stops and railway stations ought to be within easy reach. It is important to keep the elderly in close touch with their friends and relatives. Since most old people have some degree of infirmity, their beds, furniture and living accessories should be designed to suit them. Falling down stairs, slipping on polished floors, and accidents in dark corridors take a heavy toll of infirm old people."

MORRIS FISHBEIN

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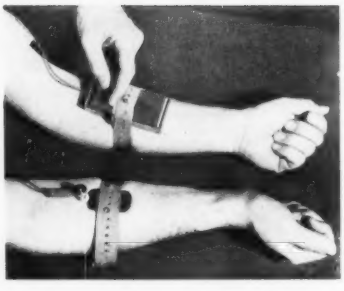

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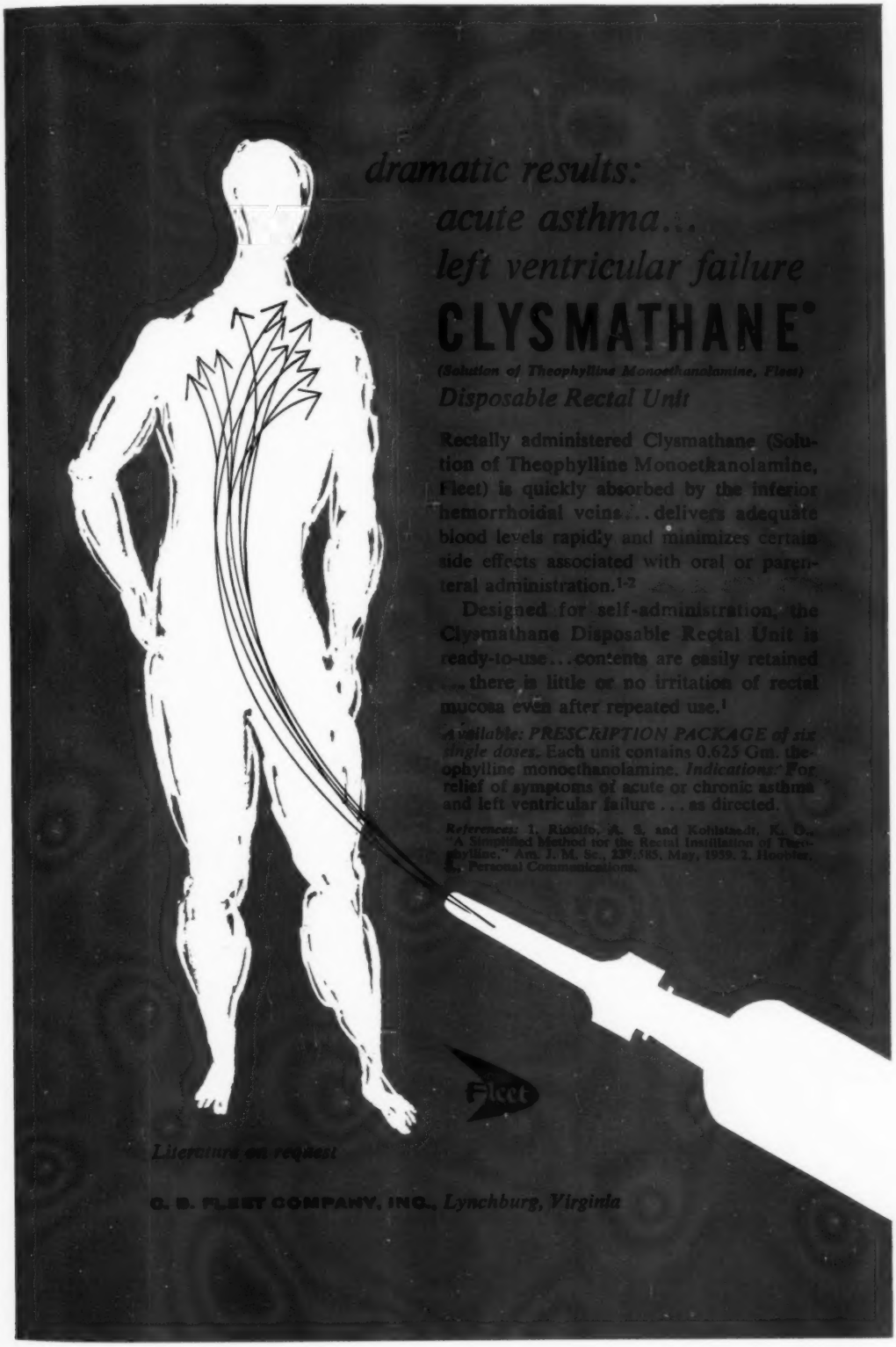
(Continued on page A-140)



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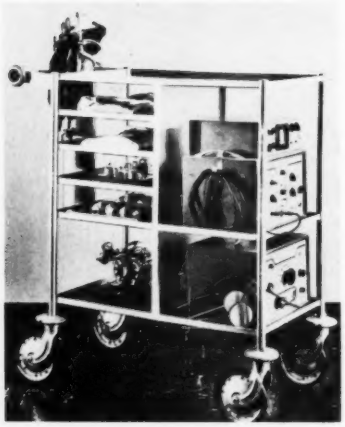

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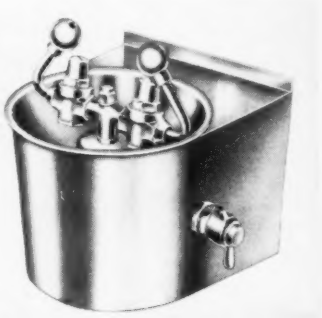

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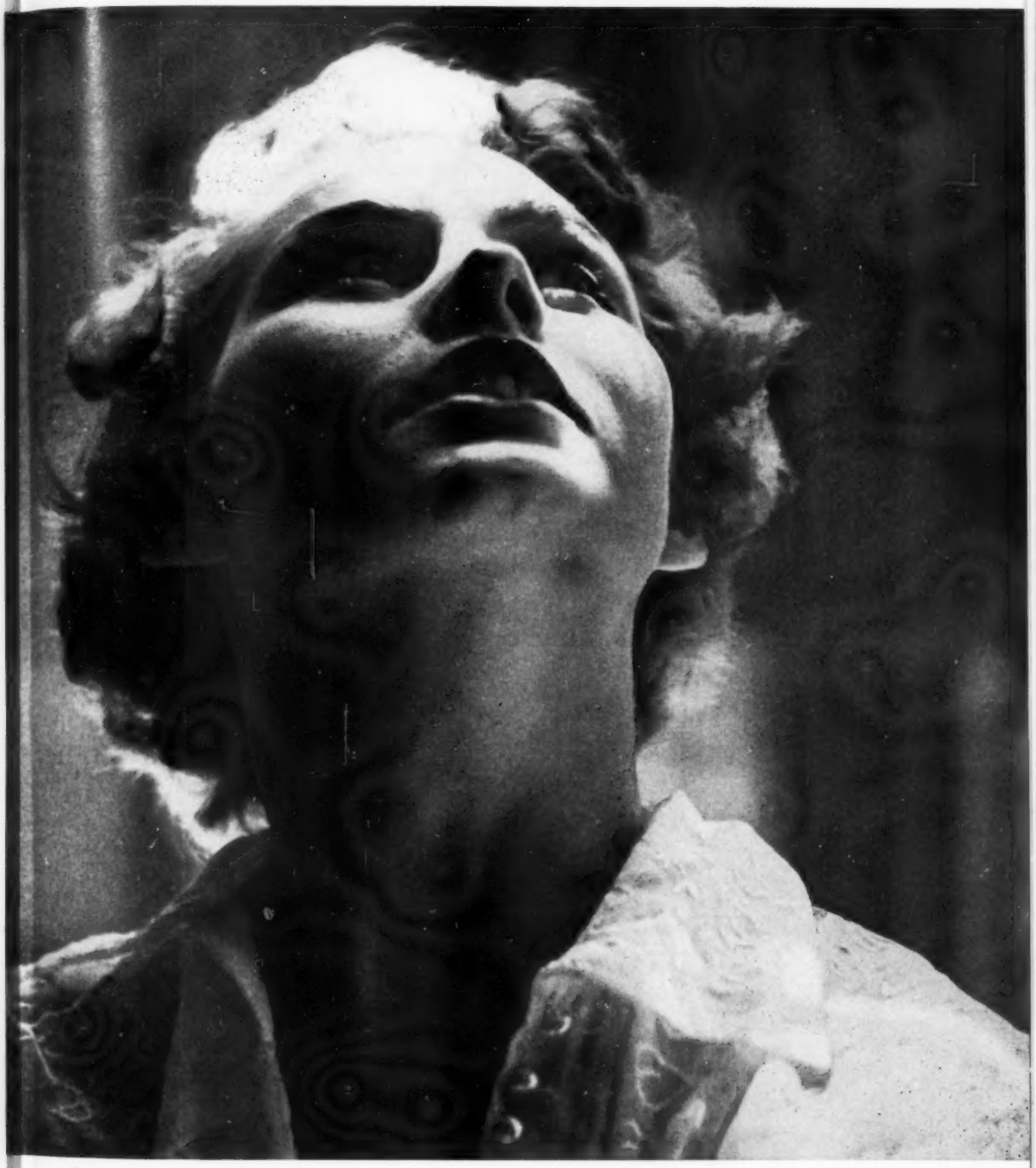

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(Continued on page A-144)

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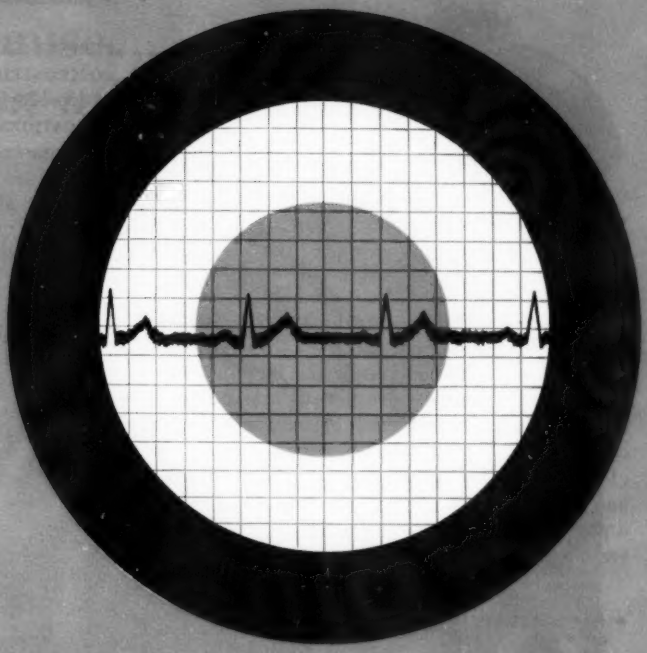

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• RESUSITUBE AIRWAY

DESCRIPTION: For mouth-to-mouth artificial respiration, this unit provides a mouthpiece for the rescuer and a breathing tube for the unconscious or nonbreathing person. Since an open air passageway is maintained, asphyxia may be prevented in persons who are unconscious but still breathing. Initial deficiency of oxygen is overcome by the amount of air moving into and out of the lungs. The unit is made of polyethylene and weighs less than 1 oz. It is available in both a pediatric size and a size for adults.
PRODUCER: Arista Surgical Company, New York.

• NARDIL TABLETS

PURPOSE: To treat mild and severe depression.
COMPOSITION: Each tablet contains 15 mg. phenelzine dihydrogen sulfate.
HOW SUPPLIED: Bottles of 100 and 5000.
PRODUCER: Warner-Chilcott Laboratories, Morris Plains, N. J.

• PENTOTHAL® SODIUM RECTAL SUSPENSION IN ABBO-SERT® SYRINGE

NEW PRODUCT FORM: Rectal suspension of Pentothal sodium in 5 gm. disposable plastic Abbosert syringe with two rectal applicators.
CAUTION: Total dose of 1 to 1.5 gm. for children weighing 75 lb. or more and 3 to 4 gm. for adults weighing 200 lb. or more should not normally be exceeded. Pentothal suspension should never be administered unless the patient can be kept under continuous observation. General contraindications are severe respiratory embarrassment, marked renal or hepatic insufficiency, and advanced cardiac disease.
DOSAGE AND ADMINISTRATION: Average dose for hypnosis is 1 gm. per 75 lb. of body weight. For basal narcosis, dose may be increased to 1 gm. per 50 lb. of body weight if the patient is normally active and robust.
PRODUCER: Abbott Laboratories, North Chicago.

• NUMORPHAN® HYDROCHLORIDE

PURPOSE: Analgesic.
COMPOSITION: *l*-14-hydroxydihydromorphinone hydrochloride.
INDICATIONS FOR USE: All instances of pain in which morphine or morphinelike synthetic agents may be used.
CAUTION: May be habit-forming.
DOSAGE AND ADMINISTRATION: Subcutaneously and intramuscularly, 1 cc. initially every four to six hours; rectally, 1 suppository every four to six hours. If necessary, the dose may be raised progressively.
HOW SUPPLIED: 1.5 mg. Numorphan per cubic centimeter in 10 cc. multiple-dose vials; 1 and 2 cc. ampules; 2 and 5 mg. suppositories.
PRODUCER: Endo Laboratories, Inc., Richmond Hill, N.Y.

• X-RAY VIEWER

DESCRIPTION: A combined light table and viewer, this unit may be used for viewing x-rays and transparencies, for making tracings, and for retouching negatives and transparencies. The body of the viewer is made of high-impact plastic; the top, which measures 11¾ by 15¾ in., is available in either translucent plexiglas or flashed opal glass. The complete unit weighs 3 lb.
PRODUCER: Activ-Ad, Inc., Toledo.

• GLARUBIN

PURPOSE: To treat intestinal amebiasis.
COMPOSITION: A crystalline glycoside from the fruit of *Simarouba glauca*.
HOW SUPPLIED: 50 mg. tablets in bottles of 40.
PRODUCER: The S. E. Massengill Company, Bristol, Tenn.

(Continued on page A-146)

In the menopause...
transition without tears

Milprem promptly relieves emotional distress with lasting control of physical symptoms

Milprem®

Miltown®+conjugated estrogens (equine)

Supplied in two potencies for dosage flexibility:

MILPREM-400, each coated pink tablet contains 400 mg. Miltown (meprobamate) and 0.4 mg. conjugated estrogens (equine).

MILPREM-200, each coated old-rose tablet contains 200 mg. Miltown and 0.4 mg. conjugated estrogens (equine).

Both potencies in bottles of 60.

Literature and samples on request.

In minutes, Milprem starts to ease anxiety and depression. It relieves insomnia, relaxes tense muscles; alleviates low back pain and tension headache. As the patient continues on Milprem, the replacement of estrogens checks hot flushes and other physical symptoms.

Easy dosage schedule: One Milprem tablet t.i.d. in 21-day courses with one-week rest periods; during the rest periods, Miltown alone can sustain the patient.

WALLACE LABORATORIES, *New Brunswick, N. J.*

CMP-9224-69

• MORNIDINE®

PURPOSE: Prevention and control of nausea and vomiting.
COMPOSITION: Each tablet contains 5 gm. of 10-[3-(4-carbamylpiperidine) propyl]-2-chlorphenothiazine. Each ampule contains 5 mg. Mornidine with 2 mg. ascorbic acid and 2 mg. sodium bisulfite in 1 cc. of aqueous solution.
DOSAGE AND ADMINISTRATION: For adults, 1 tablet or ampule every four to six hours as needed. Injections are usually given intramuscularly; if administered intravenously, each injection should be given over a five minute period.
HOW SUPPLIED: Bottles of 100 and 500 tablets; boxes of 6 and 25 ampules.
PRODUCER: G. D. Searle & Co., Chicago.

• TRIBURON® VAGINAL CREAM

PURPOSE: Microbicide.
COMPOSITION: Triclobisonium chloride.
INDICATIONS FOR USE: Vulvitis and vaginitis due to *Trichomonas vaginalis, Candida albicans* or *Hemophilus vaginalis*; streptococcal and staphylococcal infections; before operation; after cauterization, conization, irradiation and delivery.
CAUTION: If sensitization occurs, treatment should be discontinued.
DOSAGE AND ADMINISTRATION: 1 applicatorful introduced into the vagina nightly for two weeks.
HOW SUPPLIED: 3 oz. tubes with 18 disposable applicators.
PRODUCER: Roche Laboratories, Division of Hoffmann-La Roche Inc., Nutley, N. J.

• TRAL® WITH PHENOBARBITAL DROPS

NEW PRODUCT FORM: An anticholinergic plus a sedative in mint-chocolate-flavored solution for pediatric use and for adults who require a finer adjustment of the Tral dose or greater ease of administration. Each drop contains approximately 1 mg. of Tral.
CAUTION: Contraindicated in glaucoma; should be used with caution in the presence of serious cardiac disease, prostatic hypertrophy, pyloric stenosis or severe cardiospasm. Dryness of the mouth, blurred vision, constipation, urinary difficulty, and palpitation may result from excessive doses or in susceptible patients.
HOW SUPPLIED: 5 ml. bottles.
PRODUCER: Abbott Laboratories, North Chicago.

• ACTASE®

PURPOSE: To dissolve blood clots.
COMPOSITION: Human fibrinolysin.
INDICATIONS FOR USE: Pulmonary embolism and thrombophlebitis.
CAUTION: Should not be given to patients with hemorrhagic diathesis, major liver dysfunction or hypofibrinogenemia.
DOSAGE AND ADMINISTRATION: Intravenously infused over a period of two hours in 250 cc. of fluid. In thrombophlebitis, 50,000 fibrinolytic units; in pulmonary embolism, 100,000 fibrinolytic units.
HOW SUPPLIED: Vials of 50,000 fibrinolytic units.
PRODUCER: Ortho Pharmaceutical Corporation, Raritan, N. J.

• HOSE REEL

DESCRIPTION: In two-gang and four-gang models, this ceiling-mounted reel provides storage for from one to four hoses for piping gas and vacuum to operating and recovery rooms. Each hose can be used in any part of the room up to 15 ft. from the ceiling outlet and can be automatically reeled into the ceiling when not in use. Hoses are made of lightweight rubber material and are color-coded and equipped with noninterchangeable quick couplers. Both models of the reel are housed in steel cases.
PRODUCER: National Cylinder Gas Division of Chemetron Corporation, Chicago.

• LIDOSPORIN® OTIC SOLUTION

PURPOSE: To treat earache and ear infection.
COMPOSITION: Each cubic centimeter contains:

AEROSPORIN®	10,000 units
XYLOCAINE® hydrochloride	50 mg.
Propylene glycol	q.s.

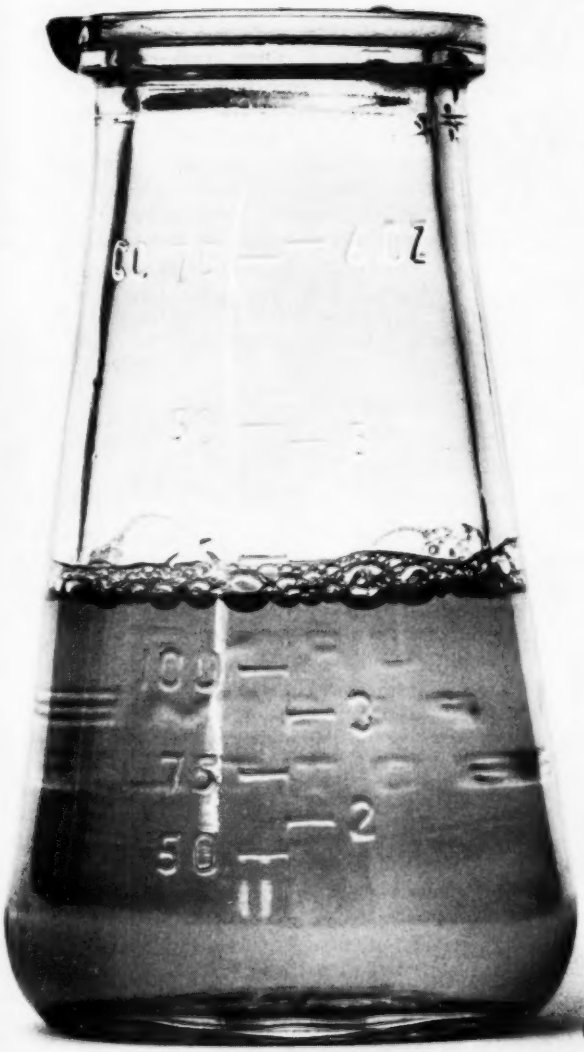
DOSAGE AND ADMINISTRATION: After cleansing and drying the ear, 3 or 4 drops are instilled three or four times daily. The solution may be applied by saturating a gauze or cotton wick, which may be left in the external auditory canal for 24 to 48 hours. The wick is kept moist by adding a few drops of solution as required.
HOW SUPPLIED: 10 cc. dropper bottles.
PRODUCER: Burroughs Wellcome & Co. (U.S.A.) Inc., Tuckahoe, N.Y.

(Continued on page A-148)

urinary discomfort, relieved within 30 minutes

The specific analgesic action of Pyridium provides rapid relief of pain, burning, urgency, frequency. By promoting more normal function, Pyridium reduces the risk of retention and pooled urine.

PYRIDIUM



PYRIDIUM®

brand of phenylazo-diamino-pyridine HCl

provides safe analgesia as long as may be required. AVERAGE DOSAGE: *Adults*, two tablets three times daily before meals. *Children, age 9 to 12 years*, 1 tablet three times daily, before meals. SUPPLIED: Tablets (0.1 Gm. each), bottles of 50, 500 and 1,000.

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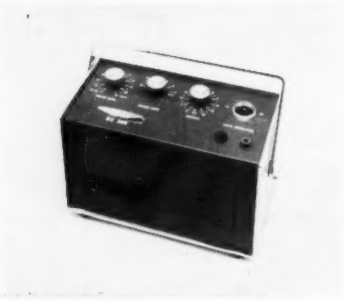
complements any anti-infective of your choice



• MS-300 MUSCLE STIMULATOR

DESCRIPTION: Providing electric stimulation of innervated muscle tissue, this compact unit produces a modified square wave pulse with a constant width of approximately 500 microseconds. The pulse rate may be varied from 1 to 85 per second. Either individual contractions or a smooth tetanic contraction may be produced; the contractions cause virtually no skin sensation. The instrument may be used in conjunction with the Burdick UT-400 Ultrasonic Unit to give the patient both ultrasonic and electric stimulation.
PRODUCER: The Burdick Corporation, Milton, Wis.

sufficient supply of
TETREX® capsules
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The Original Tetracycline Phosphate Complex

You may want TETREX to start therapy on the next patient you see with
sinusitis

BRISTOL LABORATORIES INC. SYRACUSE, N.Y.

• MARAX

PURPOSE: To control bronchospastic disorders and related allergic conditions.
COMPOSITION: Each tablet contains:

Hydroxyzine hydrochloride (ATARAX®)	10 mg.
Ephedrine sulfate	25 mg.
Theophylline	130 mg.

CAUTION: Contraindicated in patients with a history of cardiovascular disease, hyperthyroidism or chronic hypertension.
DOSAGE AND ADMINISTRATION: Adjusted according to severity of patient's complaints and tolerance. Usual adult dosage is 1 tablet two to four times daily; for children over five years of age and adults who are sensitive to ephedrine, one-half the adult dosage. Some patients require only ½ tablet at bedtime. In all cases, the interval between tablets should be not less than four hours.
HOW SUPPLIED: Bottles of 100.
PRODUCER: J. B. Roerig and Company, division of Chas. Pfizer & Co., Inc., Chicago.

• SPECTROMETER COMPUTER (Model PHA-1S)

DESCRIPTION: Designed for single-channel gamma ray pulse height analysis, this instrument is combined with a decade scaler to permit direct reading without interpolation. It is operated by a 10 turn base-level control knob, which determines threshold sensitivity, and a window control, which determines the percentage of gamma spectrum the analyzer will pass on to the scaler. The computer virtually eliminates background and scattered radiation, indicates the isotope detected, and permits counting of one isotope in combination with several others. The instrument can also be used as a decade scaler. It measures 22 by 12 by 15 in.
PRODUCER: Nuclear Measurements Corporation, Indianapolis.

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A monthly service dealing with the basic problems of increasing your net income and building personal capital . . . *in the face of today's high tax structure*

AUGUST 1959

A Savings Program Which Allows Tax Deferment - has appeal for the older doctor. It allows him to maintain savings in cash form for ready use in an emergency and yet it allows him to defer tax on savings return until professional income drops on retirement.

Some Savings and Loan Associations offer this program which combines safety (savings insured up to $10,000) with tax advantage. You agree to save specified amount each month. If you do and don't withdraw any of your savings, at the end of a certain period (say 48 months) you get a retroactive extra return, perhaps 1/4% over regular return. If you continue the savings program, the extra is increased periodically and retroactively to time you first started saving. At the end of the savings period (around 13 years), you get a full extra return retroactively of 1%. If regular savings rate is 3 1/2% and you continue savings program to completion, you get 4 1/2%.

The Internal Revenue Service now makes a concession which offers planning opportunities. Under typical plan, if you withdraw any of your savings, you forfeit not only extra on your savings up to that time but also right to any future extra. In letter ruling, the Service says that until savings program is ended (by withdrawals or completion), you don't realize income on either regular rate of return or the possible extra. Effect is to defer tax on all return until saving program's completion.

The doctor looking toward retirement some 12 years hence and wishing to keep some resources in a cash fund could utilize this savings program for tax advantage. By continuing savings program until after he retired, he could get a return of 4 1/2 to 5%, when extra is included. Yet income realization is deferred until postretirement when other income and tax rates have dropped.

Safety Of A U. S. Bond With Tax-Exempt Return - If you're looking for tax-protected return in a bond, bargains may be available in public housing issues. These are tax-exempt bonds which carry a Federal guarantee as to interest and principal payments.

Recently, issues of 19 local housing authorities were sold to give investors an interest return of about 3.8%. That was the average return. Some issues gave a lower return; others, a higher yield. Yet all the bonds carry the same Federal guarantee.

These housing bonds, in effect, have same safety as a U.S. Government bond but return is tax exempt. For the investor with taxable income of $35,000 a year, such bonds promise a return equal to fully taxable U.S. bond yielding 8%. There are, of course, no U.S. bonds furnishing such yield.

Taxes Do Affect Earnings Statements And Investment Values - Any change in tax structure affecting an industry or a company can lift up or pull down earnings and investment values. Here are two examples:

Example (1): The tax formula under which life insurance companies are taxed is to be revised. Taxes of such companies will be increased. The First Boston Corporation has estimated that average return last year of 22 life companies would have been reduced from 3.85% to 3.35% if new tax formula had been in effect.

Example (2): A 1957 court decision upheld right of cement companies to calculate tax depletion based on higher value of end product rather than on lower value of raw materials. Increased depletion correspondingly reduced tax bite. As result, profits per share of Lehigh Portland were lifted 25% in 1957 and 28% in 1958; Ideal Cement, 17% in 1957 and 15% in 1958; and Penn-Dixie, 20% in 1957 and 21% in 1958.

Before investing give some thought to impact of taxes on company under consideration. An actual or possible tax revision could have significant effect on investment values.

* * * * *

A New Partner May Purchase A Partnership Interest - in an existing professional partnership in a number of different ways. Thus, he might make a proportionate contribution in the form of cash or property to the partnership to reflect physical assets previously contributed by the other partners or acquired by the partnership and used by it. Generally, there are no immediate tax consequences to the new partner, the partnership, or other partners on such contribution. Or the new partner might purchase a retiring partner's interest in the partnership from the retiring partner. There would be immediate tax consequences to the retiring partner under those circumstances. Any profit such retiring partner realized on sale would be subject to a current tax, but the profit generally is capital gain taxed at capital gain rates.

Suppose a new partner acquires an interest in an existing professional partnership by buying part of an interest held by one of the present partners. Rather than purchasing the entire interest, he purchases only part. After purchase, both the new partner and the partner selling part of his interest continue as partners in the partnership. On his sale of part interest, the selling partner will owe a tax on any profit realized. Is such profit taxed at capital gain rates similar to the treatment accorded when an entire interest is sold? Although tax men had taken a position that similar tax rules apply, the Internal Revenue Service had not announced its position. It has now. A doctor who sells part of his interest in a partnership generally may treat as capital gain any profit realized on such sale.

* * * * *

Is Your Will Outdated? It is surprising the number of astute individuals who, once having executed a will, tend to forget it. Yet a periodic review of a will may be as important as its original execution. Intervening changes may badly date even the best planned and carefully executed will.

Changes in law - both state and Federal - may have important consequences. For instance, recent changes in trust law in New York now permit use of a testamentary trust in form which formerly was barred. For Federal tax purposes, any will drawn more than 11 years ago quite possibly could limit or bar use of the marital deduction. As a result a method of validly reducing estate taxes for property left a surviving spouse is lost.

There may have been major changes in the financial status of an individual since his will was drawn. With increased wealth, he may wish to make provision for others after his death who were originally overlooked when he had less in property holdings. Or he may have suffered financial reverses. His present will may provide for many bequests. With a smaller estate, he may wish to eliminate some of those bequests, remember only those closest to him.

Changes in the family may be another factor. When a will was drawn, consideration may have been centered on spouse and children. Now, there may be grandchildren within the family circle. Or there may have been deaths within the family. For instance, a doctor's will originally may have provided for a dependent mother in case of his premature death. The mother is now deceased.

Change in place of residence may require review and revision of an existing will. A professional man now that he is planning to retire may move his residence to another state. Probate

law of the state in which he will establish new residence may differ from state law of former residence.

* * * * *

If You Have A Son - there's an excellent chance he will want to follow in your footsteps - become a doctor. In fact, he may reach that decision at a very early age. A survey of some 3,000 Boy Scouts revealed that few sons of business executives had given much thought to career they would like to follow. And of those who had given thought to the matter, only 2% wanted to follow in their father's footsteps. On the other hand, 11% of the sons of doctors had already decided that they wished to emulate their fathers in choice of career.

Financing Your Child's Education - At the start of this year, the average tuition at private colleges throughout the United States had jumped to $525 a year. Within six years, it is estimated that such basic tuition costs will have more than doubled - run in the neighborhood of $1,300 a year. Such amount will cover only tuition. It will not cover room, board, traveling to and from school, and extras. So even if your child attends a moderately-priced school close to home, educational costs by 1965 could run close to $3,000 a year. If your child went to one of the more expensive Eastern colleges, annual educational cost might approach $4,000 a year.

Because of increasing costs, more and more parents are taking a careful look at the traditional methods of financing a child's college course. Where a parent was not able to or did not put aside funds in advance, year by year, paying educational expenses currently as they became due out of current income may no longer be practical even though parent's income is increasing. Any increased income is subject to increasing taxes. Educational costs are a personal expense and are not tax deductible. After meeting current living costs, financing a child's college education out of current income may mean a financial squeeze. Even now, a $525 tuition bill costs the parent with $25,000 income more than $900 of his before-tax earnings.

What is the alternative? There are a number of private concerns set up solely to lend money to a parent to pay college expenses of a child. Tuition and other educational costs are paid directly to the educational institution at the start of the school year. The parent in turn pays off borrowings in installments. One of the better-known women's colleges whose fees run somewhat higher than average reported that last year 22% of its enrollment was financed by The Tuition Plan, Inc., one of the leading lending firms.

Now available at cost—$1.50—3-ring loose-leaf binder to hold 24 monthly Lasser reports. Made of blue simulated morocco grain leather; non-soil finish with embossed cushion edge. Send check with name and address to POSTGRADUATE MEDICINE, Essex Building, Minneapolis 3, Minnesota.

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Few men need to buy four thousand dollars worth of equipment just to get started, as you probably did. That extra expense is only one of the many unusual financial hurdles in a medical career. Even with an above average income, it takes wise planning to meet these special problems and at the same time provide for your family's protection.

Financial planning for medical men is a specialty of Mutual Benefit Life. With over a century of service to the medical professions, Mutual Benefit Life can give you a comprehensive solution to your special problems with a personally designed and economical plan for your TRUE SECURITY.

Your Mutual Benefit Life man's counsel on your specific financial requirements is yours without obligation. You'll be able to think more soundly about the future once you've discussed TRUE SECURITY. Why not call your Mutual Benefit Life man soon

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THE MEDICAL Bookman

► INBORN ERRORS OF METABOLISM

By David Yi-Yung Hsia, M.D., Associate Professor of Pediatrics, Northwestern University Medical School, Chicago. 358 pages, illustrated. 1959, The Year Book Publishers, Inc., Chicago. $9.50.

Various metabolic conditions caused by biochemical defects of a hereditary nature are described in this provocative and interesting book. Originally, only four such conditions were recognized: albinism, alkaptonuria, cystinuria and pentosuria. Now, more than 50 conditions are known to be inborn errors of metabolism. Such diverse conditions as sickle cell anemia, erythropoietic porphyria, Wilson's disease, congenital fibrinogenemia, Von Gierke's disease, some forms of cretinism, adrenogenital syndrome, cystic fibrosis of the pancreas, Fanconi's syndrome, primary hypercholesteremia, dystrophia myotonica, and periodic paralysis are included in the current list; it is obvious that as time goes on more diseases will be included in this category.

This is the first single textbook which incorporates all of the so-called inborn errors of metabolism. Although it is obvious that in a book as short as this each condition can be described only briefly, the author has reviewed the clinical features, hereditary pattern, pathogenesis, diagnosis and treatment of each disease. A short section in the beginning is devoted to the explanation of how the abnormal genes responsible for these diseases arise, how they are transmitted, and how they are manifested in afflicted persons. The appendix contains detailed instructions for various laboratory procedures which are necessary for the detection and study of these diseases, and an excellent bibliography, containing several pertinent articles on each disease, is included. The text is liberally illustrated with genetic charts, photographs and diagrams.

This book can be highly recommended as an introduction to the inborn errors of metabolism. It must be read slowly and then reread in order to be digested. However, the time spent will be rewarding, for the reader will gain a new insight into the understanding of many diseases.

R. V. R.

► GYNECOLOGIC ENDOCRINOLOGY

By Gardner M. Riley, Ph.D., Associate Professor of Obstetrics and Gynecology, University of Michigan Medical School, Ann Arbor. 330 pages with 72 illustrations. 1959, Paul B. Hoeber, Inc., Medical Book Department of Harper & Brothers, New York. $8.50.

With the rapidly changing factors and interpretations in gynecologic endocrinology, general practitioners, as well as specialists, have looked forward to a concise presentation of such changes. Dr. Riley has accomplished this in a most satisfactory manner. He has presented the endocrinologic status of the female during the various phases of her life, and, in addition, has included a section on the technics, value and limitations of many endocrinologic diagnostic procedures.

The book is organized into three sections: the fundamentals of hormonal physiology; clinical problems and the management of dysfunctional states occurring in infertility, adrenal hyperplasia, abortion and menopausal difficulties; and technical details and the applications of useful endocrinologic diagnostic procedures.

E. A. B.

(Continued on page A-188)

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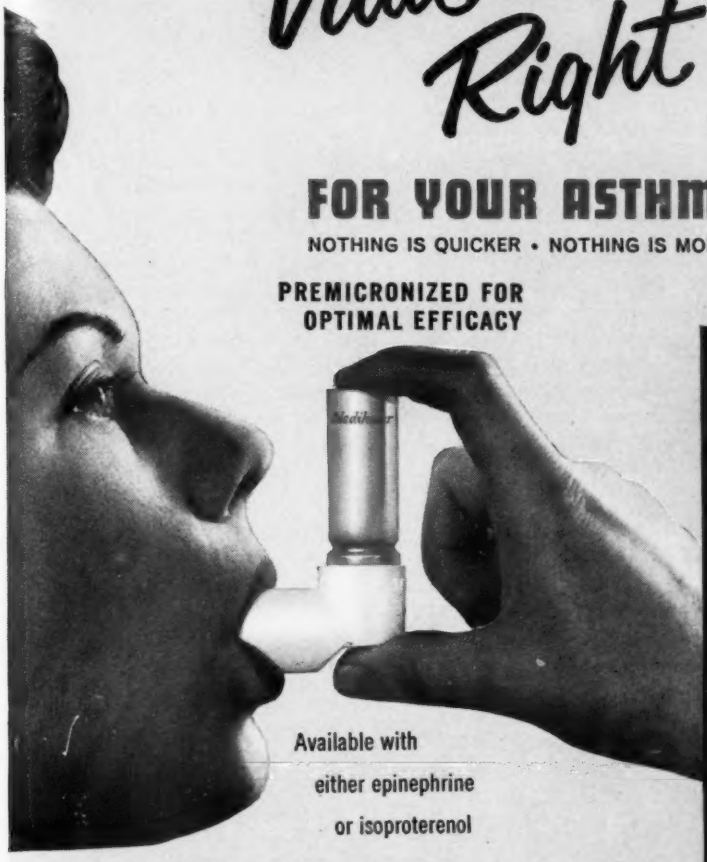

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Epinephrine bitartrate, 7.0 mg. per cc., suspended in inert, nontoxic aerosol vehicle. Contains no alcohol. Each measured dose contains 0.15 mg. epinephrine.

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Isoproterenol sulfate, 2.0 mg. per cc., suspended in inert, nontoxic aerosol vehicle. Contains no alcohol. Each measured dose contains 0.06 mg. isoproterenol.

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automatically measured-dose aerosol medications

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Riker Northridge, California

NOTABLY SAFE AND EFFECTIVE FOR CHILDREN, TOO.

► TUMORS OF THE BLADDER

Edited by David M. Wallace, F.R.C.S., Senior Lecturer, Institute of Urology, University of London, London, England. Series on neoplastic disease at various sites. Vol. 2. 352 pages with 202 illustrations. 1959, E. & S. Livingstone Ltd., Edinburgh and London. Distributed by The Williams & Wilkins Company, Baltimore. $11.50.

Issued under the general direction of Professor D. W. Smithers, University of London, this monograph is a fitting companion to the first volume, which dealt with carcinoma of the lung. Mr. Wallace, a prominent London surgeon and urologist, had the assistance of many distinguished British contributors in the preparation of seven chapters and an appendix, which comprise a comprehensive dissertation on vesical neoplasms. Urologists in particular and all others interested in keeping abreast of developments in the field of cancer will find this volume most useful.

Few tumor sites in the body are receiving as much attention with respect to carcinogenesis as is the urinary bladder. This interest is generated by the accelerating incidence of vesical tumors and by the similarity in appearance of experimentally produced lesions and those which occur naturally. The discussion of various ramifications of this influential research, in the first three sections of the monograph, deserves special commendation.

The fourth section, which deals with the pathologic features of vesical neoplasms, emphasizes the importance of considering both the histologic grade of malignancy and the depth of penetration in the delineation of these tumors. The classification described is similar to the one in favor in the United States except for the use of words rather than letters and numbers to define stage and grade.

The final four sections present methods of diagnosis and treatment and an analysis of the results of treatment of carcinoma of the bladder at the Institute of Urology and the Royal Marsden Hospital, London. It is pointed out that penetration of tumors through the muscularis of the bladder minimizes the potentiality of cure by local forms of treatment, and that lesions with superficial invasion and early undifferentiation may be treated by several methods, any one of which may be successful at times. Several types of radiotherapy were extensively employed.

D. E. U.

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ileitis or colitis

BRISTOL LABORATORIES INC. SYRACUSE, N.Y.

► APPLIED MEDICAL LIBRARY PRACTICE

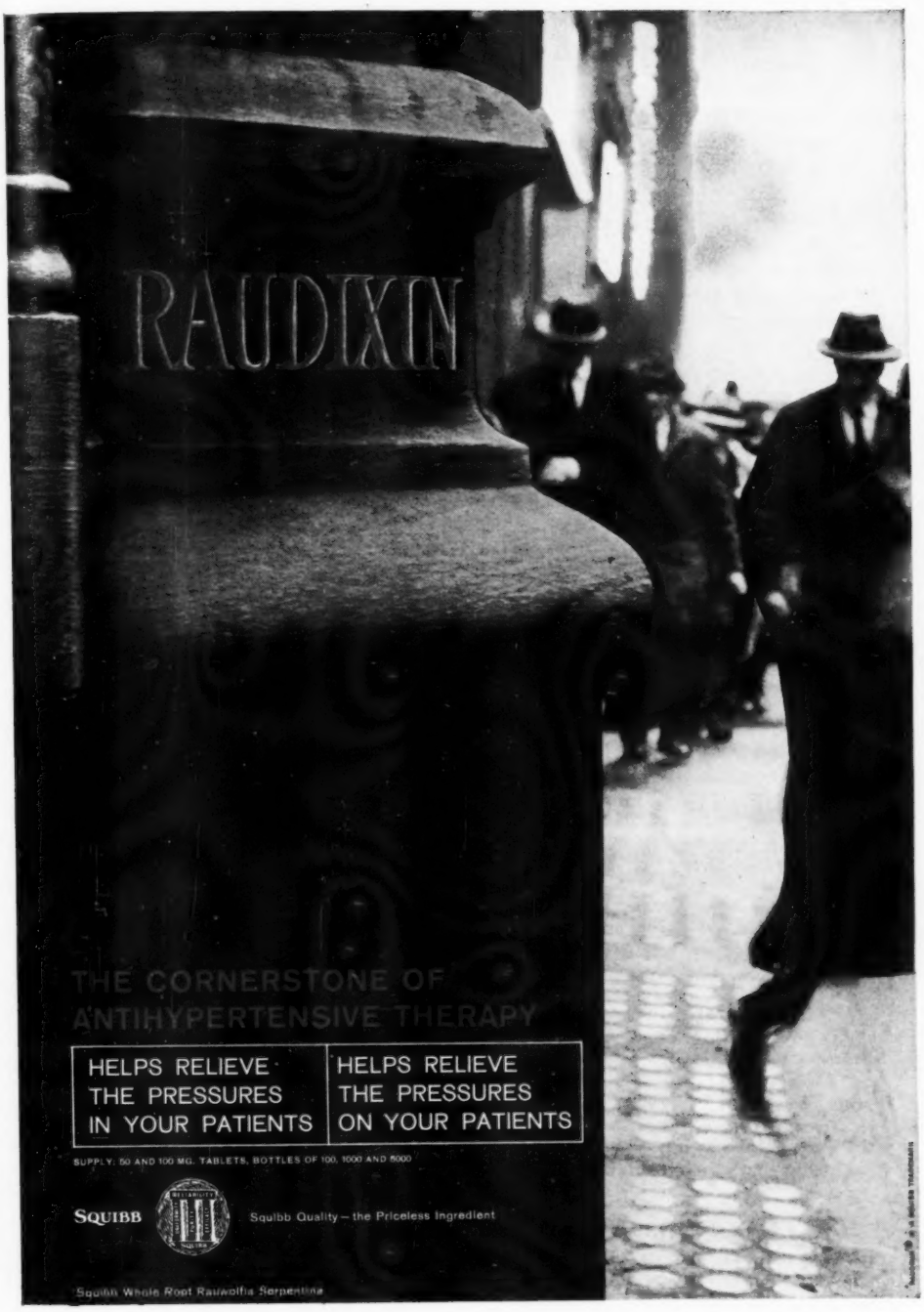
By Thomas E. Keys, M.A., Librarian, Mayo Clinic, Rochester, Minnesota. 495 pages. 1958, Charles C Thomas, Springfield, Illinois. $10.75.

Whereas the medical school of an earlier period may have been built around anatomy, surgery or pathology, the medical school of today is built around its library. Hundreds of hospitals have excellent medical libraries, many of which are the property of medical societies. The number of librarians has never been adequate to the need.

This book contains discussions about administration of a library, how to buy books and catalogue them, how to use current medical periodicals and medical indexes, and how to prepare a bibliography. Some of the author's accumulations, such as lists of publishers, medical journals and dealers in new and old medical books, are invaluable to the medical librarian. In addition, an appendix offers a list of famous medical books available in facsimile.

M. F.

(Continued on page A-190)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ANTIHYPERTENSIVE THERAPY
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THE PRESSURES
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THE PRESSURES
ON YOUR PATIENTS
SUPPLY: 50 AND 100 MG. TABLETS, BOTTLES OF 100, 1000 AND 5000
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Squibb Whole Root Rauwolfia Serpentina

► BLEEDING ESOPHAGEAL VARICES: PORTAL HYPERTENSION

By Hirsch Robert Leibowitz, M.D., Assistant Professor of Clinical Medicine, New York University College of Medicine, New York. 986 pages with 178 illustrations. 1959, Charles C Thomas, Springfield, Illinois. $24.50.

The completeness of this scholarly review of basic and clinical data related to portal hypertension and its sequelae makes it a gold mine of information and of references concerning many aspects of the internal anatomy of the liver, the hemodynamics of the portal venous system, and allied subjects. After developing the concepts concerning the normal parenchymal and vascular anatomy of the liver, hepatic blood flow, and portal venous pressure, the author discusses the changes caused by disease.

The text contains a discussion of the pathogenesis of portal hypertension which accompanies disease of the liver and of the extrahepatic portal system. The clinical manifestations of collateral circulation, bleeding from varices, hepatic portal cerebral encephalopathy, and diagnosis are covered thoroughly. The sections on portal venography and on procedures for portacaval shunt and other operations for patients who bleed from varices were written with the collaboration of Dr. Rousselot, a pioneer in these fields.

Its comprehensiveness probably will make this book most useful to the physician, surgeon or investigator who is particularly interested in this subject. I hope others who are seeking answers to specific questions related to clinical problems will not be discouraged by the scope of the work, because, although this is certainly no brief and ready outline of therapy, its scheme of presentation makes readily available the practical information one may need. Examples of this are the discussions of radiologic diagnosis of esophagogastric varices, of balloon tamponade to control bleeding from varices, and of surgical treatment.

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► REMINISCENCES AND ADVENTURES IN CIRCULATION RESEARCH

By Carl J. Wiggers, M.D., Professor Emeritus of Physiology, Western Reserve University School of Medicine, Cleveland. 404 pages with 82 illustrations. 1958, Grune & Stratton, Inc., New York and London. $9.75.

Dr. Wiggers has long been known as a leader in research on circulation. His pupils have distinguished themselves throughout the world. Yet, with all his acumen and brilliance, he has attempted here a well-nigh impossible task—the combining of an autobiography with a review of research in both the basic sciences and the clinical aspects of disturbances that occur in the circulatory system.

I found his notes relative to his life, education and career fascinating. Certainly they should be inspiring to young men who lean toward the basic sciences. I found his adventures in research somewhat difficult, because of the whole change in tone, and a little dull, because research in this field has already gone far beyond the excellent and sound studies which Dr. Wiggers initiated and which he described in this book.

The indexers and librarians will have some difficulty in deciding just where to place this book. It is divided into two sections, and I am convinced that two separate books would have been advisable.

M. F.

► THE HAND
Its Anatomy and Diseases

By John J. Byrne, M.D., Professor of Surgery, Boston University School of Medicine, Boston. 384 pages with 166 illustrations. 1959, Charles C Thomas, Springfield, Illinois. $10.50.

Dr. Byrne has produced a concise and clear textbook which encompasses his extensive experience on the hand service of the Boston City Hospital. The anatomy and embryology of the hand are well covered, and there is a very worthwhile chapter on bacteriologic factors which are prominent in surgery of the hand. The traumatic factors of problems involving the hand are thoroughly discussed, and, throughout the text, attention is given to the practical aspects of treating such injuries. Diseases of the hand and the effects of occupation on the hand are considered; the final portion of the book is devoted to reconstructive surgery.

The illustrations are adequate, although in some instances the magnifications of the photomicrographs are of such low power that it is questionable whether they are of value to the reader. The roentgenograms are well reproduced, and there are many interesting and informative photographs showing various conditions of the hands. In short, although not as complete or inclusive as many others on this subject, this is an excellent reference textbook.

E. W. J.

► OFFICE GYNECOLOGY

By J. P. Greenhill, M.D., Senior Attending Obstetrician and Gynecologist, Michael Reese Hospital, Chicago. Ed. 7. 572 pages with 145 illustrations. 1959, The Year Book Publishers, Inc., Chicago. $9.00.

Dr. Greenhill has made several important changes in almost every chapter in this new edition of his book. He also has included new contributions on pediatric and geriatric gynecology and a summation of our present knowledge of intersexuality.

Although it is not meant to be a text, this volume provides a ready source of reference to almost all gynecologic conditions which might be treated in general office practice.

E. A. B.

(Continued on page A-193)

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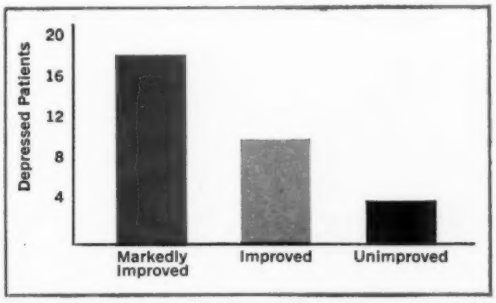

1. Agin, H. V.: In A Pharmacologic Approach to the Study of the Mind, Springfield, Ill., Charles C Thomas, in press.
2. Agin, H. V.: Conference on Amine Oxidase Inhibitors, New York Academy of Sciences, Nov. 20-22, 1958.

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BOOKS RECEIVED

Books received are acknowledged in this department. As space permits, books of principal interest to our readers are reviewed more extensively.

Diseases of Metabolism. Detailed methods of diagnosis and treatment. Edited by Garfield G. Duncan, M.D., Professor of Medicine, University of Pennsylvania School of Medicine, Philadelphia, with 22 contributors. Ed. 4. 1,104 pages, illustrated. 1959, W. B. Saunders Company, Philadelphia and London. $18.50.

The Biochemistry of Clinical Medicine. By William S. Hoffman, M.D., Professorial Lecturer in Medicine, University of Illinois College of Medicine, Chicago. Ed. 2. 734 pages with 63 illustrations. 1959, The Year Book Publishers, Inc., Chicago. $12.00.

Genetics, Radiobiology and Radiology. Proceedings of the Midwestern Conference of the National Academy of Sciences-National Research Council, May 1958. By Wendell G. Scott, M.D., Professor of Clinical Radiology, Washington University School of Medicine, St. Louis, and Titus Evans, Ph.D., Head, Radiation Research Laboratory, State University of Iowa College of Medicine, Iowa City. 149 pages, illustrated. 1959, Charles C Thomas, Springfield, Illinois. $5.50.

A Textbook of Neurology. By H. Houston Merritt, M.D., Professor of Neurology, Columbia University College of Physicians and Surgeons, New York. Ed. 2. 765 pages, 182 illustrations. 1959, Lea & Febiger, Philadelphia. $12.50.

Patient Care and Special Procedures in X-ray Technology. By Carol Hocking Vennes, R.N., formerly Surgical Supervisor and Clinical Instructor, and John C. Watson, R.T., Director of Courses in X-ray Technology, University of Minnesota Hospitals, Minneapolis. 203 pages with 61 illustrations. 1959, The C. V. Mosby Company, St. Louis. $5.75.

The Anastomoses Between the Leptomeningeal Arteries of the Brain; Their Morphological, Pathological and Clinical Significance. By Henri M. vander Eecken, M.D., Professor of Medical Psychology, Faculty of Medicine, University of Ghent, Ghent, Belgium. 160 pages with 62 illustrations. 1959, Charles C Thomas, Springfield, Illinois. $7.50.

Surgery of the Ear. By George E. Shambaugh, Jr., M.D., Professor of Otolaryngology, Northwestern University Medical School, Chicago. 669 pages with 326 illustrations. 1959, W. B. Saunders Company, Philadelphia and London. $24.75.

The Treatment of Diabetes Mellitus. By Elliott P. Joslin, M.D., President, Diabetes Foundation, Inc., Howard F. Root, M.D., Physician, New England Deaconess Hospital, Priscilla White, M.D., Assistant Professor of Pediatrics, Tufts University School of Medicine, and Alexander Marble, M.D., Assistant Clinical Professor of Medicine, Harvard Medical School, Boston. Ed. 10. 798 pages, illustrated. 1959, Lea & Febiger, Philadelphia. $16.50.

(Continued on page A-195)

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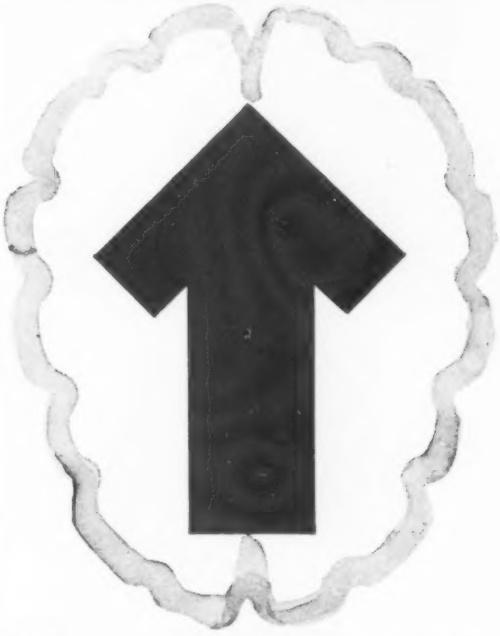

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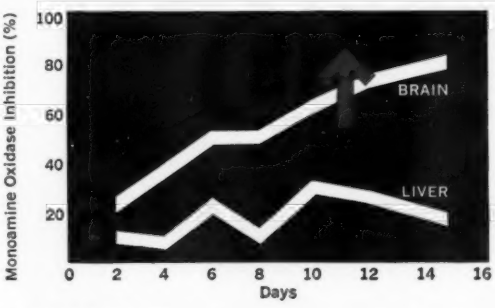

Horita, A.: Report, Mar. 17, 1959

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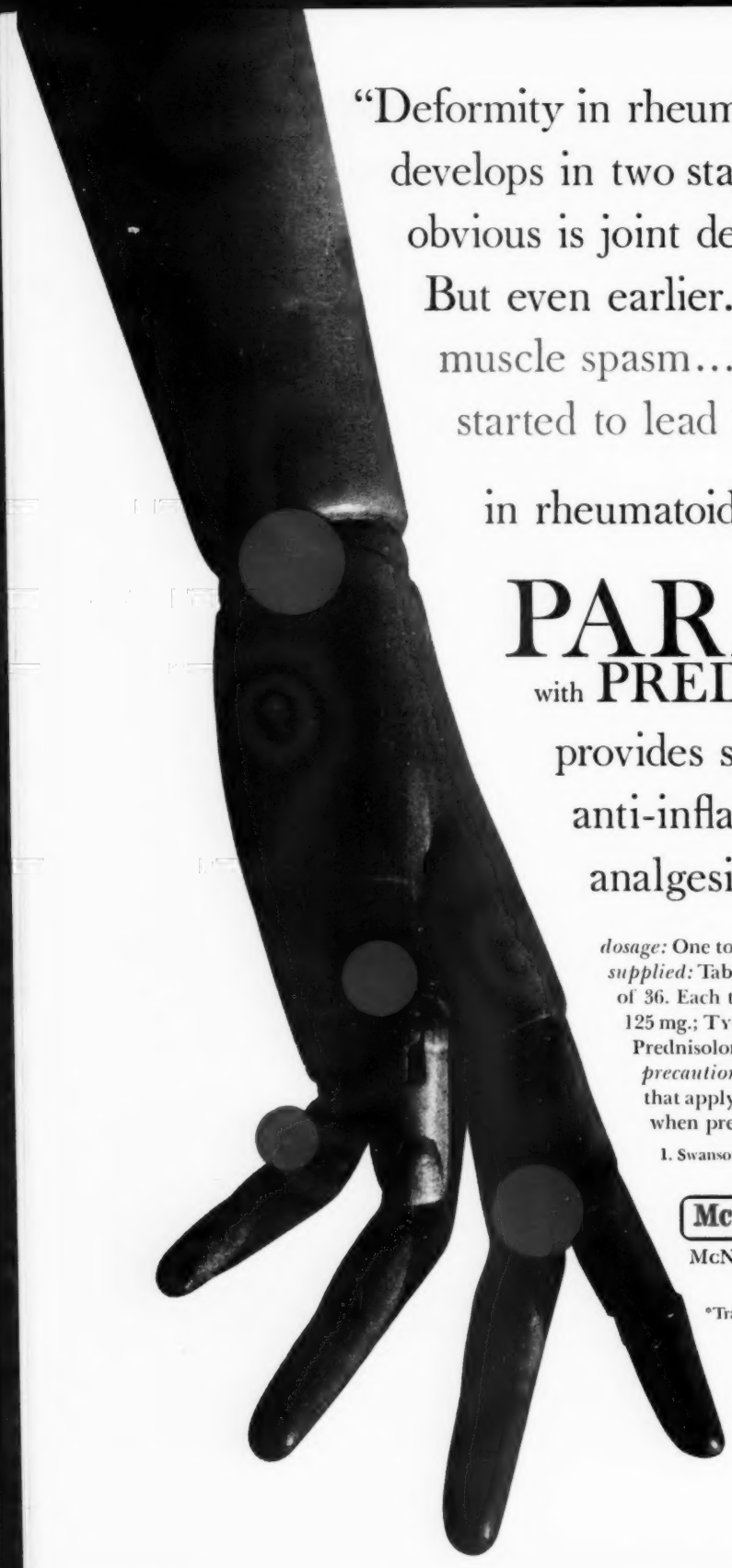

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1. Swanson, J. N.: Canad. M. A. J. *79*:638 (Oct. 15) 1958.

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Intracranial Calcification. By Fermo Mascherpa, Chief of the X-ray Department, Milan Neurological Institute, Milan, Italy, and Vincenzo Valentino, Radiologist of the Institute of Semeiological Medicine, Naples University, Naples, Italy. 150 pages with 98 illustrations. 1959, Charles C Thomas, Springfield, Illinois. $9.50.

Collected Papers of the Mayo Clinic and the Mayo Foundation. Vol. 50. 791 pages, illustrated. 1959, W. B. Saunders Company, Philadelphia and London. $13.00.

The Amphetamines; Their Actions and Uses. American Lecture Series. By Chauncey D. Leake, Ph.D., Professor of Pharmacology, Ohio State University, Columbus. 167 pages. 1959, Charles C Thomas, Springfield, Illinois. $4.50.

Elementary Statistics With Applications in Medicine and the Biological Sciences. By Frederick E. Croxton, Ph.D., Professor of Statistics, Columbia University, New York. 376 pages, illustrated. 1959, Dover Publications, Inc., New York. $1.95.

Shakespeare and Medicine. By R. R. Simpson, M.B., Hull, Yorkshire, England. 267 pages. 1959, E. & S. Livingstone Ltd., Edinburgh and London. Distributed by The Williams & Wilkins Company, Baltimore. $6.00.

Research in Aging; VA Prospectus. Symposium presented at meeting of the Veterans Administration Advisory Committee for Problems of Aging. 125 pages with 48 illustrations. 1959, U. S. Government Printing Office, Washington, D.C. $1.50.

Pancreatitis; a Clinical-Pathologic Correlation. By Herman T. Blumenthal, M.D., Associate Professor of Pathology, St. Louis University School of Medicine, and J. G. Probstein, M.D., Associate Professor of Clinical Surgery, Washington University School of Medicine, St. Louis. 379 pages with 58 illustrations. 1959, Charles C Thomas, Springfield, Illinois. $9.50.

British Medical Bulletin. Blood Groups. Symposium prepared by 20 contributors. Vol. 15. No. 2. 174 pages. 1959, Medical Department, The British Council, London. $3.25.

Dental-Medical Emergencies and Complications. By Ira Jay Berlove, D.D.S., Attending Surgeon and Chief of Maxillofacial and Oral Surgery Service, Misericordia Hospital, New York. 380 pages. 1959, The Year Book Publishers, Inc., Chicago. $7.50.

Pathology. By Peter A. Herbut, M.D., Professor of Pathology, Jefferson Medical College, Philadelphia, and 21 contributors. Ed. 2. 1,516 pages with 758 illustrations and 6 color plates. 1959, Lea & Febiger, Philadelphia. $18.50.

"Allergic" Encephalomyelitis. A symposium on Experimental "Allergic" Encephalomyelitis and Its Relation to Other Diseases of Man and Animals, October 1957. Edited by Marian W. Kies, Ph.D., Chief, Section of Biochemistry, Laboratory of Clinical Science, National Institute of Mental Health, Bethesda, and Ellsworth C. Alvord, Jr., M.D., Associate Professor of Neurology and Pathology, Baylor University College of Medicine, Houston, with 60 contributors. 576 pages, illustrated. 1959, Charles C Thomas, Springfield, Illinois. $13.50.

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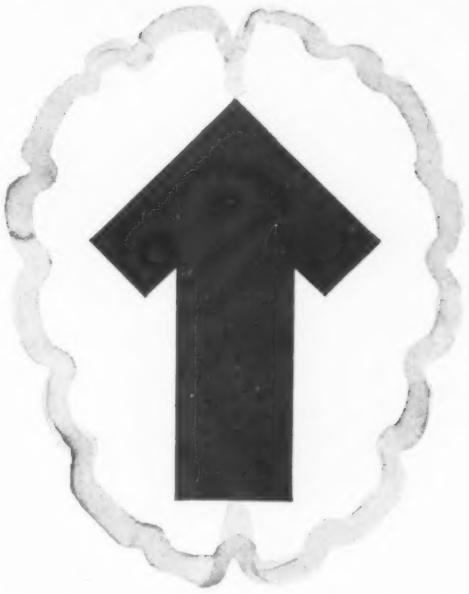

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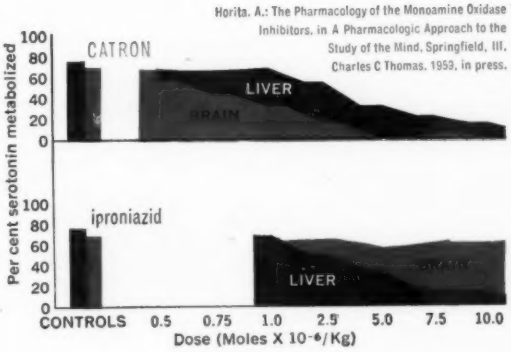

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Numorphan—Endo ... A-144-224
Soma—Wallace ... A-38-39

Anesthetics, Local and General
Pentothal Sodium—Abbott ... A-144

Antacids and Intestinal Adsorbents
Aludrox SA—Wyeth ... A-8
Maalox—Rorer ... A-108

Antiallergics
Benadryl—Parke-Davis ... A-88
Co-Pyronil—Lilly ... A-5
Cortrophin-Zinc—Organon ... A-125-127
Dimetane—Robins ... A-41; Facing A-41
Marax—Roerig ... A-148
Naldecon—Bristol ... A-142
Nalertan—Irwin, Neisler ... A-90-91
Novahistine—Pitman-Moore ... A-10
Triaminic—Smith-Dorsey ... A-18

Antiarthritics
Anturan—Geigy ... A-57
Arthropan—Purdue-Frederick ... A-9
Butazolidin—Geigy ... A-225
Decabamate—Merck Sharp & Dohme ... A-84-85
Decadron—Merck Sharp & Dohme ... Second Cover
Pabalate—Robins ... A-172
Pabalate-HC—Robins ... A-172
Parafon with Prednisolone—McNeil ... A-194

Antiasthmatics
Bronkotabs—Breon ... A-61
Elixophyllin—Sherman ... A-32
Medihaler-Epi—Riker ... A-187
Medihaler-Iso—Riker ... A-187
Nephenalin—Leeming ... A-141
Tedral—Warner-Chilcott ... A-117
Tedral anti-H—Warner-Chilcott ... A-132

Antibacterials
Altafur—Eaton ... A-34-35
Cosa-Tetrastatin—Pfizer ... A-228

Antibiotics
Chloromycetin—Parke-Davis ... A-182
Cosa-Signemycin—Pfizer ... A-40
Cosa-Tetracyn—Pfizer ... A-192
Kantrex—Bristol ... Facing A-224-225
Tetrex—Bristol ... A-83-95-142-148-188-190-229-230-231

Anticholinergics
Daricon—Pfizer ... A-137
Enarax—Roerig ... A-166-167
Milpath-200—Wallace ... A-136
Milpath-400—Wallace ... A-15
Tral—Abbott ... A-146

Anticoagulants
Coumadin—Endo ... A-64
Heparin in Saline—Abbott ... A-138

Antidepressants
Catron—Lakeside ... A-191-193-195-197-198-19
Deaner—Riker ... A-3
Deprol—Wallace ... A-7
Nardil—Warner-Chilcott ... A-12-13-14
Niamid—Pfizer ... Facing A-54-
Tofranil—Geigy ... A-160-16

Antidiabetics
Diabinese—Pfizer ... A-7
Orinase—Upjohn ... A-18

Antidiarrheals
Cremomycin—Merck Sharp & Dohme ... A-
Donnagel—Robins ... A-13
Donnagel with Neomycin—Robins ... A-13
Polymagma—Wyeth ... A-15

Antiemetics
Bonamine—Pfizer ... A-204-20
Mornidine—Searle ... A-14
Prozine—Wyeth ... A-15

Antihistamines
Ambodryl—Parke-Davis ... A-2
Disomer—White ... A-66-
Perazil—Burroughs Wellcome ... A-
Polaramine—Schering ... A-62-73-226-227-2

Anti-Inflammatories
Sigmagen—Schering ... A-50-

Antispasmodics
Butibel—McNeil ... A-10

Ataractics
Atarax—Roerig ... A-
Dartal—Searle ... A
Mellaril—Sandoz ... A-222-2
Meprospan—Wallace ... A-13
Miltown—Wallace ... Facing A-
Phenergan—Wyeth ... A-
Seco-Synatan—Irwin, Neisler ... A-1
Stelazine—Smith, Kline & French ... A-13
Tentone—Lederle ... A-36-
Thorazine—Smith, Kline & French ... A-177-1

Cardiovascular Agents
Cartrax—Roerig ... A-1
Decadron—Merck Sharp & Dohme ... Third Co
Dilcoron—Winthrop ... A
Esidrix-Serpasil—Ciba ... A-173-174-175-1
Harmonyl—Abbott ... Facing A-2
HydroDiuril—Merck Sharp & Dohme ... A-154-1
Hydropres—Merck Sharp & Dohme ... A-142-220-2
Miltrate—Wallace ... A-
Moderil—Pfizer ... A-124-1
Pentoxylon—Riker ... A-
Peritrate—Warner-Chilcott ... A-2
Raudixin—Squibb ... Facing A-88-89; A-1
Rautrax—Squibb ... Facing A-88-
Serpasil—Ciba ... A-1
Singoserp—Ciba ... A

Choleretics and Hydrocholeretics
Cholan—Maltbie ... A-26-

Coagulants
Antihemophilic Plasma—Hyland ... A-
Polybrene—Abbott ... A-1

(Continued on page A-200)

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BONAMINE REFERENCES:

1. Moyer, J. H.: M. Clin. North America, Mar., 1957, p. 405.
2. Seidner, H. M.: Illinois M. J. 109:20, 1956.
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DR. Pepys' Pages

Personal Diary
and Observations on
Medical Life
by MORRIS FISHBEIN, M.D.

May 29—To Orly airport and aboard Air France; the meal is superb, and the flight to London is just one hour. So to Claridge's and there found the usual superb service and graciousness. In the evening to see a thin farce called "Gilt and Gingerbread."

May 30—To the *Times* bookstore to look over recent arrivals and the paperbacks. At my desk all afternoon. For tea came Dr. Wyburn-Mason of Richmond with his helpmate, and we talked of new concepts of cancer and of neurology and of the differences between practice in the United States and in Great Britain. In the evening to see and hear "Candide," a musical based on Voltaire's satire, written by Lillian Hellman, music by Leonard Bernstein, with lyrics by Richard Wilbur, John LaTouche and Dorothy Parker, and we found it all wholly enjoyable. So back to Claridge's for a snack in the Causerie, and there were the obstetrician Ferguson from Miami and his lady and with them Tompkins, an obstetrician from Guy's Hospital.

May 31—At noon driving to Cambridge to visit Sir Henry Willink, now master of Magdalene College and formerly Minister of Health in the Churchill government. His lady is a sister of Mike Fletcher of the *Practitioner* and a niece of Sir Walter Fletcher, who did so much for medical education in Britain. And she was born in Harley Street. So saw the house and had lunch where came also the son Stephen, who is a teacher of Latin and Greek.

Thereafter visiting the Pepys Library and spent some hours viewing the treasures, and saw there a book by Father Hennepin describing his discovery of the source of the Mississippi River, and also a drawing of Niagara Falls which is a wonder. The maps of New France and all the territory down to the Gulf of Mexico were intriguing. Even more interesting were the original shorthand transcriptions of the famous diary and Pepys' own books numbering some 2,474 in the original bookcases plus the Additament of 526 books. Here were Pepys' own shorthand notes with his transcription in a beautiful handwriting of the escape of Charles II from the battle of Worcester in 1680. All this was especially opened for us and displayed by the librarian R. W. Ladborough and also by D. Pepys Whitely, a descendant of Samuel Pepys, Esquire.

So drove back to London and walked with Mistress Pepys talking of our day and suddenly saw a man looking in a window on New Bond Street admiring the antiques, and said to Mistress Pepys, "That man looks exactly like Milton Biow"—and it was!

June 1—All morning at Foyle's most miraculous bookstore which has now grown so large and unwieldy that the attendants find difficulty in finding the books, in finding the status of the customers, and sometimes even in finding themselves. However, was able to purchase several fine additions to my collection of biographies, notably André Maurois' "New Life of Alexander Fleming," and several books of reminiscences by general practitioners.

At noon to Claridge's came Sir Russell Brain, Sir Geoffrey Marshall, Dr. W. Ritchie Russell, Dr. Bradley of the Ministry of Health, and Mr. R. T. Hewitt, secretary of the Royal Society of Medicine, and we discussed the possibilities for the Fifth International Congress to be sponsored by the National Foundation. All the discussion was most interesting and concerned with the virus diseases, the threats of virus infections to prospective mothers, congenital malformations and similar related topics. In the evening to dinner with Dr. Hugh Clegg, editor of the *British Medical Journal*, and his lady Kira.

June 2—All the morning at my DICTAPHONE® and at noon to Scott's famous restaurant in Piccadilly. The restaurant is hundreds of years old, representing three original taverns on Windmill Road in the seventeenth century. The word "piccadilly" comes from "pickadel," which was the ruff worn by the gallants of that period. Here with Harvey Flack, editor of *The Family Doctor*, who is soon to come to the United States for some 16 lectures to various audiences.

In the afternoon walking through the market on Brewer Street, which is reminiscent of old Maxwell Street in Chicago. At 5 o'clock came Clayton-Jones who works on *World-Wide Abstracts* in London and who is also an active worker in the Cerebral Palsy Association of Great Britain. He was on the way to the meeting of "our club" of Guy's Hospital, which has been meeting 100 years, always on the night before the Derby. Next came Irving Stein and his fair

lady to dinner with us and off to a theater called "The Mermaid."

June 3—Early awake and to London airport to take Pan American Jet which stopped at the Azores for more fuel and came in one hour late, but altogether a beautiful flight to Idlewild. Next with Mistress Pepys in a taxi to LaGuardia where she departed for Chicago. Thereafter to the Waldorf, and the evening was spent in straightening out the messages and the mail.

June 4—First came William Marsden to work out the program for our editorial conference and then came Basil O'Connor with Mel Glasser, and so together we designed a series of formulas for the International Congress sponsored by the National Foundation which will deal in 1960 with congenital malformations and viruses.

In the afternoon, following lunch with Stanley Henwood and the dictation of many documents, to visit Milton Runyon and Ralph Beebe at Doubleday and arrange our various affairs. Next to the Taylor-Carlisle bookstore to assemble some of the important books which have appeared since my departure. In the evening came Mark Soroko and with him to dine at the Black Angus cafe. Then as the evening grew late to visit with Herbert and Grace Mayes, and eventually Dr. Morris Friedell arrived.

June 5—This morning assembling with the American editors of *World-Wide Abstracts* and here were Perrin Long, Baumgartner, Phelps, Stanley Truman, DeTar, Luisada, Ed Weiss, Jonathan Forman and Harry Dowling. All drove to Morris Plains, meeting there with Elmer Bobst and Leonard Scheele and our associates. In the afternoon to visit the research laboratories and heard a fine talk by Dr. Arnow forecasting trends in pharmaceutical research and in particular mentioning the focus of interest now on psychic energizers. Visiting us also was Dr. M. Arthur Kline, who comes from Vienna to attend the American Medical Association meeting. In the evening driving back to New York for dinner with Friedell.

June 6—At the desk and at noon to Atlantic City, meeting on the train Ray Rice of Eli Lilly, Indianapolis, and Dr. and Mrs. Kelley of Cornell. In Atlantic City the officials began to assemble at the Traymore Hotel, and old Pepys trod the Boardwalk meeting Boris Burns and also Paul Barton with whom I worked so many years, and found John Bach established with the largest pressroom he has ever assembled. Among others Frank Fowler told how Illinois is likely to get the funds needed for tuberculosis.

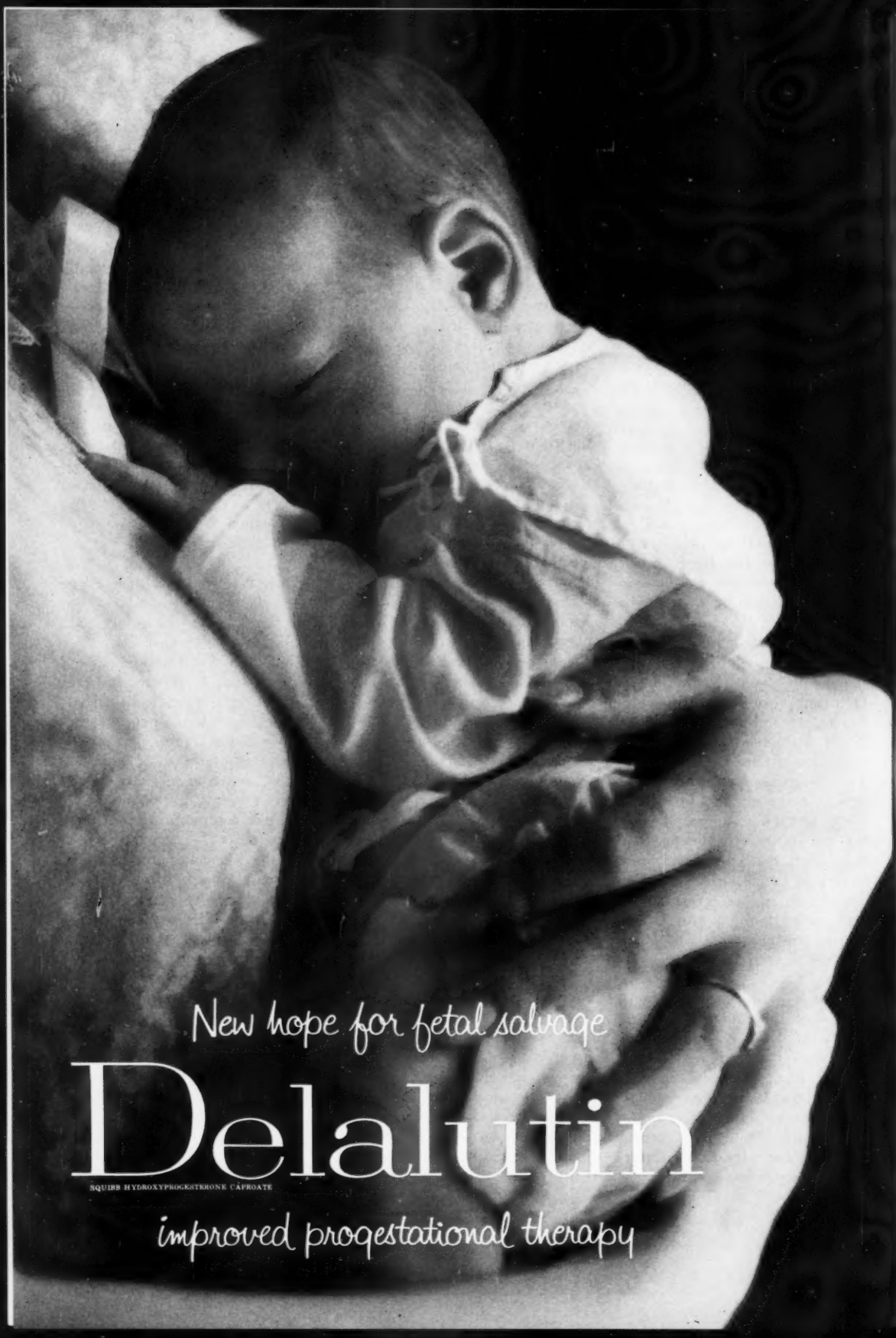
June 7—Lay late studying the program of the annual session of the American Medical Association and the newspapers supplied by various agencies, and found communications much improved as far as information concerning the various features of the session is concerned. Thereafter to walk along the Boardwalk, coming to the Ritz Hotel and there saw Mark Soroko and his lady. In the afternoon to the yacht harbor and there met Frank Berger, Peter Warren, Ted Gotthelf, Stanley Behrman and others of Wallace Laboratories. The weather was beautiful, but the yacht was outside Cape May and something was wrong with its filter. Then to walk along the Boardwalk and en route meeting many of the dermatologists, including the Rattners from Chicago. At the Traymore saw Gus Buie and Costello and Elmer Weigel of the New Jersey friends and others, including Tom Hull.

At midnight Mistress Pepys drove in from Philadelphia accompanied by my old friend Bill Molony of Los Angeles. After settling her in the room, discovered that she was eager to trot the Boardwalk; so out we went and as we strolled met Joe Kirsner and his sweet lady and their big son and also many gastroenterologists. It was rather amazing that so many gastroenterologists were out after midnight seeking a sandwich and a snack. When we went to the coffee shop there was Samuel Weiss, still another gastroenterologist.

June 8—This morning to visit the Industrial Exhibit which before that was the Technical Exhibit and even before that the Commercial Exhibit, and since the Industrial Exhibit is now so scientific and the Scientific Exhibit inclines somewhat toward the commercial, presumably the time has come for all of these to be just one exhibit. Here many friends greeting old Pepys and much new information about the new products.

In the afternoon a reception and cocktail party for all the science writers by the Schering Corporation with Mr. and Mrs. Francis C. Brown as our genial hosts. At the same time a cocktail party for POSTGRADUATE MEDICINE with Dr. Mayo, Teresa Cohen and Sylvia Covet as the reception committee, and here another group of editors and writers and others of the intelligentsia. Thereafter to the Ritz Hotel where Mr. Mark Soroko and his Rose entertained at a dinner honoring Mistress Pepys.

(Continued on page A-211)


New hope for fetal salvage
Delalutin
SQUIBB HYDROXYPROGESTERONE CAPROATE
improved progestational therapy

The results of administering Delalutin before the 12th week of gestation to 82 women with habitual abortion were reported recently by Reifenstein.[1] Every patient had experienced at least three consecutive abortions immediately preceding the treated pregnancy. More than 68% of these women were delivered successfully and uneventfully following Delalutin therapy.

Boschann,[2] in a study of pregnancies with threatened abortion, found that:

37% of 73 pregnancies were carried to term without progestational therapy
64% of 42 pregnancies were salvaged by progesterone
83% of 73 pregnancies were salvaged by Delalutin

Eichner,[3] found that with Delalutin fetal salvage of infants below term weight (1000 to 2000 gm.) was significantly improved.
108 (76%) of 142 babies of this birth weight survived without progestational therapy.
16 (100%) of 16 babies of this birth weight survived with Delalutin therapy.
A comparison study was made of a group of repeated aborters treated with Delalutin, and a group with a similar history treated with bed rest and sedation.[4] Pregnancy salvage with Delalutin was twice that of the control group. Delalutin was found to be "highly active", well-tolerated and long-acting.

Delalutin offers these advantages over other progestational agents:

- longer-acting and more sustained therapy
- more effective in producing and maintaining a completely matured secretory endometrium
- no androgenic effect
- more concentrated solution requires injection of less vehicle
- unusually well-tolerated, even in large doses
- requires fewer injections
- low viscosity makes administration easier

DELALUTIN is also potent and safe therapy for: threatened abortion; post-partum after-pains; amenorrhea, primary and secondary; dysfunctional uterine bleeding not associated with genital malignancy; infertility with inadequate corpus luteum function; production of secretory endometrium and desquamation during estrogen therapy; premenstrual tension; dysmenorrhea; cyclomastopathy, mastodynia, adenosis and chronic cystic mastitis.

Administration and Dosage: Because of its low viscosity, Delalutin may be administered with a small gauge needle (deep intragluteal injection). Complete information on administration and dosage is supplied in the package insert.

Supply: Delalutin is available in vials of 2 and 10 cc., each cc. containing 125 mg. of hydroxyprogesterone caproate in sesame oil, and benzyl benzoate.

References: 1. Reifenstein, E. C., Jr.: *Annals N. Y. Acad. Sci.* 71:762 (July 30) 1958. 2. Boschann, H-W.: *ibid.*, p. 727. 3. Eichner, E.: *ibid.*, p. 787. 4. Hodgkinson, C. P.; Igna, E. J., and Bukeavich, A. P.: *Am. J. Obst. and Gyn.* 76:279, 1958.

SQUIBB *Squibb Quality—the Priceless Ingredient*

'Delalutin'® is a Squibb trademark

let pollen counts jump...

AMBODRYL®

for relief of hay fever symptoms

Sneezing, nasal congestion, and related hay fever discomforts can be relieved all summer long with AMBODRYL—an antihistaminic of unusual potency. Most patients can enjoy a symptom-free season—with little likelihood of side effects—on as little as 75 to 100 mg. a day. And on those days when the pollen count jumps, this dosage may be doubled or even tripled with little possibility of unfavorable reactions.

AMBODRYL Hydrochloride (bromodiphenhydramine hydrochloride, Parke-Davis) is available in the following forms:

AMBODRYL Hydrochloride Kapseals,® 25 mg. each, bottles of 100 and 1,000.

AMBODRYL Hydrochloride Elixir, 10 mg. per 4 cc.; 16-ounce bottles.

AMBODRYL Hydrochloride Steri-Vials,® 5 mg. per cc., for parenteral use. Supplied in 10-cc. Steri-Vials, boxes of 1 and 10.

PARKE, DAVIS & COMPANY
DETROIT 32, MICHIGAN

03359

Total last season to date, 4,867.

(The daily records of the U. S. Weather Bureau begin at midnight Eastern Standard Time, or 1 A. M., Eastern Daylight Time.

*A degree day (for heating) is the technical term for the number of degrees the mean temperature falls below 65. The American Society of Heating Engineers has designated 65 as the point below which heating is required.

POLLEN COUNT

Daily pollen counts compiled for information of hay fever sufferers and physicians are shown below. Each count represents the average number of pollen particles per cubic yard of air in the 24-hour period. The following table shows counts for the last seven days.

Tuesday	17
Wednesday	42
Thursday	61
Friday	78
Saturday	25
Sunday	47
Monday	79

The Summary

Showers and thunderstorms continued yesterday from southern Virginia and the eastern Tennessee Valley southward into Florida, and in the Gulf States and Texas. There were thunderstorms in the Rockies and the western parts of South Dakota, Nebraska and Kansas.

A warming trend was reported in the Pacific Northwest, the Northern and Central Plains States, eastern Wyoming and Colorado and the Tennessee Valley. Cool dry air covered New England and Minnesota.

An area of high pressure will cover the middle Mississippi and Ohio Valleys this morning. The rest of the country will be under the influence of low pressure. A trough will extend from the North Carolina coast southward through the South Atlantic States to a low-pressure center in the Gulf of Mexico and then curve northwestward through the Plains States to southeastern Montana. Other low-pressure centers will be off the northern California coast, in Nevada and just north of Montana.

Scattered showers and thunderstorms are forecast for today in the Gulf States, southern Georgia, South Carolina and Florida. The northeastern quadrant of the country will be sunny, except for southern Maryland and eastern Virginia which may have rain. Thunderstorms are predicted for the higher Sierras, the Rockies, the Central Plains States and western Texas. A warming trend will be observed in the upper Mississippi Valley, the eastern Dakotas and eastern Nebraska.

The Forecast

United States Weather Bureau.
(As of midnight)

NEW YORK CITY, LONG ISLAND AND NORTHERN NEW JERSEY — Fair and [illegible] today, afternoon temperatures

Weath

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Amarillo
Atlanta
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Baltimore
Bismarck
Boston
Buffalo
Calgary
Charleston, S.
Chattanooga
Chicago
Cincinnati
Cleveland
Concord
Denver
Des Moines
Detroit
Duluth
Edmonton
El Paso
Fort Worth
Galveston
Hartford
Indianapolis
Jackson
Jacksonville
Kansas City
Key West
Los Angeles
Louisville
Memphis
Miami
Milwaukee
Minn.-St. Paul
Mobile
Montreal
Nantucket

Fine speeches were made by Elmer Bobst, who was the master of ceremonies, and Mark and Howard Rusk and also a spontaneous address by Gladys Rusk; then Alfred Strauss pitched in, and so with a fine tribute from Mark Soroko a beautiful evening. Perhaps best of all was the address made by Mistress Pepys acknowledging the beautiful tribute tendered to her.

June 9—This morning with Milton Lasdon touring the Scientific Exhibit, and rather startled by the great number of those which represented research with funds granted by the leading pharmaceutical industries. Startled also to see how many of the medicos were undertaking their periodic physical examination. At noon Mr. Elmer Bobst entertained the editors of *World-Wide Abstracts* and other guests on the yacht "Alisa V." Here came Baumgartner, Truman, Phelps, DeTar and others along with Howard Rusk and Dr. Herbert Cooper.

In the afternoon was a cocktail party by the Pepsi Cola Company, a meeting of the National Association of Science Writers, a meeting of the U. S. Committee of the World Medical Association, and a fine cocktail party given by Warner-Chilcott.

June 10—This morning some hours spent with the Dictaphone and the typewriter and at noon again to the yacht "Alisa V," and here came many of the science writers, including Severino "ditto," Art Snider, Gilbert Cant, Marguerite Clark, Victor Cohn, Delos Smith, Van Dellen, Bob Potter, Johnson Hammond, Ellwood Douglass, Austin Smith, Walter Kahoe, Teresa Cohen and Sylvia Covet, and also the ladies of all of those who had their ladies with them. Then, too, came Gerald Gross, representing the Washington contingent, and William Marsden, the executive editor of *World-Wide Abstracts*.

In the afternoon to attend the annual award of the Passano Foundation, given this year to Dr. Stanhope Bayne-Jones, and Nick Eastman presided. With old Pepys at the table sat Dr. George Corner and his lady, and altogether the occasion was salubrious. Here were the officials of the American Medical Association and many of the elite, including Alton Ochsner and Mike DeBakey and Elmer Hess.

After the Passano dinner, on to the thirty-second Silver Slipper Party, which our host Elmer Bobst had arranged.

June 11—Early awake and to walk with William Lasdon among the exhibits, meeting my dear friend John McKeen of Pfizer, who is more enthusiastic than his most enthusiastic detail man about his products. Then by the motorcar to Philadelphia, and flying on the nonstop plane to Chicago.

June 12—The desk is piled high, and old Pepys begins to reduce the mountain of correspondence and editorial tasks. At noon to the Standard Club for a luncheon to begin organization of the second Salute to Medical Research under the auspices of the City of Hope and found an overflowing attendance and great enthusiasm.

June 13—Again at the desk and betweentimes finished the Max Wiley novel which is based on the life of Eugene O'Neill and found it a little disturbing because of the overflow of alcoholism. In the afternoon to La Rabida for a fine symposium arranged by Al Dorfman, with much interesting discussion on connective tissue by Klemperer, Meyer, Gross and Ziff. In the afternoon when F. Howell Wright presided, there were some clever analyses of experimental methods by Chandler A. Stetson, Jean Oliver, Barkulis and Rammelkamp. In the evening to the Congress Hotel where Albert Pick presided and where Walter Bauer described the beginnings of the center for the study of rheumatic diseases at the Massachusetts General Hospital, and he ended with a passionate plea for doctors who will care for the sick.

June 14—Early to the desk and then come the little grandchildren from all the three families and we had our Sunday brunch. Thereafter to La Rabida where Aims C. McGuinness gave the Remer Lecture to a sizable audience, indicating his belief that much remains to be learned about rheumatic fever. Lowell Coggeshall, his predecessor in the office of the Secretary of Health, made the introduction. Then came the dedication ceremonies for the new research pavilion where Albert Pick presided and many speakers participated, including James Gately of the Chicago Park District, Kirkpatrick substituting for Lawrence Kimpton, old Pepys and John Mentzer, chairman of the building committee, who made the presentation of the Richard J. Finnegan Memorial Building, which incorporates the Variety Club Research Center. Young Richard Finnegan accepted for the Finnegan family, Bill Margolis for the Variety Club, and Al Dorfman for the scientists. Thus ended a significant day in the progress of scientific research and in the growth of this great center.

(Continued on page A-212)

June 15—Early awake with a great mass of reading—meaning the medical journals and other publications. Next to be a participant on Don McNeill's Breakfast Club, and got on real well with Warren Hull of "Strike It Rich," who was substituting for him. So late to fly on TWA and Allegheny to Atlantic City, reading two miserable thrillers en route. At the door of the Shelburne to greet old Pepys were Curtice Rosser, Con Amore V. Burt, Harry Bacon, Gus Buie and many others.

June 16—Viewing the exhibits and then to participate in a symposium moderated by Con Amore V. Burt on "The future of the practice of medicine." Dr. Morris Brand, medical director of the Sidney Hillman Health Center of New York, told "What labor expects from medicine." In a quiet, direct manner, he asked for organized medical services of high quality covered by nonprofit insurance. Dr. W. Benson Harer of Upper Darby, Pennsylvania, told "What medicine expects from labor," and was heartily cheered for his defense of free choice of physician, high-quality service, and recognition by unions of doctors as equal partners. Lawyer William F. Martin of New York spoke of "The effects of malpractice suits on the practice of medicine" and illustrated his points with some good cases. Old Pepys discussed "Changing concepts in the practice of medicine," tracing the evolution of voluntary insurance and emphasizing the need for planning as well as anticipating legislation.

Next for a walk with Curtice Rosser and had a sandwich lunch with fresh blueberries. Had a light supper in the coffee house with young Sullivan, a nephew of our late friend Arthur of Madison, and saw Brigitte Bardot in "Love Is My Profession," my first view of this sexy dame and thought of her as a "no-brainer" with appendages.

June 17—All the morning reading and writing. Finished Robert Molloy's "The Reunion," a nostalgic novel of life in Charleston. In the evening to a cocktail party in the penthouse of the Shelburne tendered by Karl Zimmerman, Pittsburgh, president of the American Proctologic Society. At the dinner old Pepys spoke on travel, and sat between Mrs. Nigro of Detroit and Richard Hopping of East Orange.

June 18—Awake at 5:30 A.M. and to the airport; then by Allegheny and TWA to Chicago. So all the afternoon at the desk and at night to walk with Mistress Pepys along the shore of beautiful Lake Michigan.

June 19—For luncheon came Mr. Grimes and Drs. Turner and Hair to discuss the home-care program for the Cook County Hospital, which is long overdue in its establishment. In the afternoon again at the desk and in the evening to the Quadrangle Club, where Dr. Jacobson and Beth held high festivities for the marriage of their daughter, and here sat with Professors Bobrinskoy and Bay and with Oscar Meyer and Irwin Lieferman and his wife Sylvia.

June 20—At noon to the country club to play at golf with the Friedells, he making a 39 and old Pepys a 48 for nine holes, which was all that the time allowed. Then to the Blackstone Hotel where some 350 medical assistants and their bosses assembled, and here the new officers were inducted, old Pepys spoke on "Doctors and specialists," and the girls themselves put on a most humorous vaudeville in which new words were set to old operatics. Monseigneur John S. Quinn did the invocation. And here with the assistants were Fred Falls, Cesare Portes, Morris Friedell and other medical leaders, and, in particular, Dr. Josiah Moore, my classmate.

June 21—To Highland Park to spend Father's Day with the family.

June 22—With the Board of Directors of the Lyric Opera, Stepan presiding with the force which has carried him far in the drug and chemical industry, and it would seem that our season will be exceptional with new operas, new singers and, best of all, new support. Reading now Wiggers and finding in the pages many references to many friends.

June 23—At the desk and at noon to play at golf, about the same as previously. Then dined with the Hirsches and the Friedells and played at bridge.

June 24—By the late plane to New York City and immediately off to see Sam Levene in "Make a Million."

June 25—Early talking to Julius Cahn about a project for his committee. Then to visit Doubleday and saw the birth of my new work, "The Modern Family Health Guide," along with Milton Runyon and Ralph Beebe. Thereafter to visit Dr. Parmele and Lewis Gruber at Lorillard. At noon with Basil O'Connor, Mel Glasser, Tom Rivers and Stanley Henwood to luncheon and to consider the organization of the International Congress on

Congenital Malformations which will be held in London, July 18 to 22, 1960. Next to visit Freeman Daniel high in Radio City and after some hours of conference back to the Waldorf. With Mistress Pepys to dine at Daniel's, warmly welcomed by Frank Garlasco, and then to see Ethel Merman in "Gypsy."

June 26—Among the shops and then to luncheon with Max Geffen and Bill White at Radio City Club. Next came Dr. Charles Haney and Bill Haney and with them driving to Mahopac, visiting its 17 bed hospital, and attending a cocktail party given by Mrs. Rebecca Jackson at her Forest Hills Hotel. Next to the high school for a great dinner where John W. Dain presided and met there the medicos Garrett Vink, Matthew Jacobs and Edward Rohmer and Molly Picon and Ben Kalish. The banquet was a great success in launching a drive, for the Mahopac area requires hospitalization for a large population. Next with Bill Lasdon, Dr. Milton Freiwald and Nan to drive to Katonah.

June 27—Lay late reading a novel by Vatsek about the British and the Egyptians and the trouble at Suez. In the afternoon to tramp through the woods and after some two miles of this swimming in the pool. In the evening Mistress Pepys and I played a tie with Bill and Mildred in gin.

June 28—Again lay late reading the New York *Times* and the *Herald-Tribune* which could easily occupy some weeks. At noon to luncheon with the Freiwalds and the Lasdons and then home on American Airlines.

June 29—At the desk and there came visitors from here and there to discuss pending projects. In the evening to dine with the Maurice Goldblatts.

June 30—From New York came Max Geffen about publishing. At noon to the Victory Dinner of the Chicago Heart Association, where were Emerson Foote who will head next year's campaign, and Ebbers who went well over 100 per cent this year. In a panel Louis Katz along with his associates demonstrated the new technic for tape recording the heart sounds of school children which are then screened for the abnormal, and these children are given early consideration by the diagnosticians. Art Snider presided as moderator, and the drama of the beating heart stilled the audience. Here also were DeWitt Clough and his successor, Louis deBoer.

In the late afternoon to assemble with many of the family at the dinner of the Alliance Français held in Chicago's new French restaurant, the Pavillon, and talked at some length with the Kestnbaums who had just come from dinner with the President. Here also Arthur Shaw who designed our new coliseum and many others.

The Medical Muse

RICHARD ARMOUR

CLINICAL NOTE ON BRAVERY

A very common theme of jokes,
As well as of cartoons,
Is how, a hypo near his hide,
Some big strong fellow swoons.

The hairy-chested he-man type,
The driver of a bus,
Faints dead away, sometimes, from fear,
And makes a dreadful fuss.

Now this is very funny. Yes,
And more than likely true,
Except that frail and skinny chaps
Are thus affected, too.

PICTURE THIS

An x-ray man I heard of once,
First-rate, top of the heap,
Who loved his x-ray pictures so
He took them home to keep.

In fact he had the best ones framed
And hung them on the wall
In living room as well as den
And all along the hall.

Yes, he's devoted to his work,
Quite competent and smart.
And you should hear how people praise
His taste in modern art.

for your G.U. patients

FREEDOM

FURADANTIN

brand of nitrofurantoin

IN SEVEN YEARS NEGLIGIBLE DEVELOPMENT OF BACTERIAL RESISTANCE WITH FURADANTIN